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Original Articles.

SERVICE NOTES FROM THE GREAT WAR, 1793—1815.

By D. G. CRAWFORD, M.B.,

LIEUT. COLONEL, I.M.S.,

Civil Surgeon, Hughli

ON 8th February 1793 began the long struggle with France, which lasted for twenty-two years, till it came to an end on 18th June 1815, at Waterloo. During this period France and England were almost continually at war, the only break being for a period of about one year, after the peace of Amiens, signed on 27th March 1802. At sea the struggle went on in both hemispheres. The chief naval actions were fought in the Mediterranean, in the Atlantic, and among the West Indian islands, but many French men-of-war, as well as some of the smartest privateers France could build and equip, sought the Far East, and reaped a rich harvest among the Company's Indiamen. The latter, as a rule, "took its fighting," and sometimes were successful in beating off their assailants. But they were seldom a match for a man-of-war, or even for a well-found privateer, which, if of less size and tonnage, was built for speed, and carried heavier weight of metal and a much larger crew of fighting men. The French men-of-war and privateers found a safe refuge in the harbour of Port Louis, the chief town of Mauritius, where they could refit when damaged in action, and replenish their exhausted stores. In no part of the world did French sailors meet with more success than in Eastern seas, where they carried their depredations to the very mouth of the Hughli. In 1810 the Governor-General, Lord Minto, sent an expedition from India which conquered the French islands, and, with the seizure of their harbour of refuge, the interference by the French ships with the Company's commerce came to an end.

At the same time the war went on steadily on land. England despatched the ill-fated Walcheren expedition to the Low Countries, and maintained the long dogged struggle in the Peninsula. In the East the French power had long vanished from India, but the Nizam maintained a large sepoy force of 23 battalions, officered and disciplined by Frenchmen, and commanded by Raymond, till Lord Mornington, in 1798, insisted on its disbandment. Tipu Sultan of Mysore proclaimed an offensive and defensive alliance with the French Republic, but never got any help, other than empty words, from his European allies. And with the fall of Seringapatam and death of Tipu, in May 1799, Mysore came under the English suzerainty. In March 1801 the Governor-General, now Marquis

of Wellesley, despatched a force *via* the Red Sea to Egypt, to co-operate with the English army there. But the Indian contingent, commanded by Sir David Baird, arrived too late to take any part in the fighting. Colonel Wellesley, afterwards the Duke of Wellington, was to have gone with this Expedition as second in command, but fell ill at Bombay, in March 1801, and was unable to go. The illness was fortunate, for the ship in which he had intended to sail was lost, with all on board, between Bombay and Egypt.

James' Naval History ⁽¹⁾ gives an account of every action fought at sea, between French and English ships, throughout the war, including not only battles between fleets and squadrons, but actions between single ships, cutting out expeditions, etc. In nearly every case full lists of the killed and wounded are given, including the names of all commissioned and warrant officers. Only one Naval Medical officer appears actually to have fallen in action throughout the war, Assistant-Surgeon James Larans, of the frigate *Horatio*, who died of wounds received in a boat expedition, when the frigate's boats cut out a Danish armed schooner and cutter on the coast of Norway on 1st August 1812. Many, of course, perished in shipwrecks, and other naval disasters. When the *Queen Charlotte*, 100-gun line of battle-ship, the flagship of Admiral Lord Keith, was burned off Leghorn on 17th March 1800, the whole medical staff, one Surgeon and three Surgeon's mates, were among those who perished out of a complement of 840, only 167 were saved, while 673, including almost all the officers, were lost.

A century ago Surgeons were rated very low in the matter of rank. An Admiralty Order of 28th September 1808 (quoted in the supplement to the *Gentleman's Magazine*, Vol. II, 1808) confers upon Masters in the Navy the rank of Lieutenant, to take rank in their ships next after the junior Lieutenant, and have precedence of Surgeons in the Navy. At this time, and for half a century longer, few medical officers in the I.M.S. could attain to a rank higher than that of Captain. The Members of the Medical Board ranked as Lieutenant-Colonels; Superintending Surgeons, corresponding to the modern Deputy Surgeon-Generals and Colonels, ranked as Majors, Surgeons as Captains, Assistant-Surgeons as Lieutenants. But not one man in ten rose to be a Superintending Surgeon, and the rank was seldom if ever attained with less than thirty years' service.

Among other items of interest mentioned in James' work the following may be quoted. The crew of the 38 gun frigate *Hermione*, Captain Hugh Pigot, mutined off Porto Rico on 22nd September 1797. The captain and almost

(1) "The Naval History of Great Britain, from the Declaration of War by France in February 1793, to the accession of George IV in January 1820." By William James. A new edition (the second) in six volumes—London printed for Harding, Lepard & Co., Pall Mall, East, 1828.

all the other officers were killed, among them the surgeon, whose name is not given. The *Hermione* was handed over by the mutineers to the Spaniards. She was retaken just a month later, on 21st October, being cut out from under the guns of Porto Cabello by the boats of the 28-gun frigate *Surprise*, Captain Edward Hamilton. One of the boats was commanded by the Surgeon of the *Surprise*, John McMullen. On 6th May 1801 the British 14-gun sloop *Speedy* took the Spanish xebec *Gamo* off Barcelona. The *Gamo* had a crew of 280 men, with 32 guns, while the *Speedy* had only 54 men, all told, on board. But she was commanded by Lord Cochrane. All the fifty-four took a hand in the fight, the Surgeon of the *Speedy*, James Guthrie, steering her into action. On 19th February 1801 the British frigate, *Phæbe*, took a famous French frigate, *L'Africaine*, off Centa. On board the *Africaine* three French Surgeons were killed by an unfortunate shot while dressing the wounded in the cockpit.

While only a few of the officers of the Indian Armies were ever opposed to the French on land, any man going home from India, soldier or civilian, might find himself, at a moment's notice, required to fight for his ship, usually with no great hope of success. The *Calcutta Gazette* of 9th August 1804 relates the capture, on 14th August 1803, off Ferrol, of the East Indiaman *Lord Nelson* by the French privateer *Bellone*. This action is also described in greater detail by James. Among those killed, when the *Lord Nelson* was taken by boarding, were Surgeon William Spottiswoode, and Lieutenant-Colonel Peter MacGregor Murray, of the Bengal Army. Another description of this capture may be found in the *Gentleman's Magazine* for September 1803. Here it is stated that Lieutenant-Colonel Murray originally went out to India as a Surgeon's mate about 1773, and subsequently received a combatant commission; he had been Adjutant-General of the Bengal Army, and was retiring with a fortune of £200,000¹. William Spottiswoode, who was a brother of the Captain of the *Lord Nelson*, entered the Bengal Army as Assistant-Surgeon on 23rd April 1781, and became Surgeon on 1st June 1796. The *Lord Nelson* was retaken a few days later by the *Colossus*.

On 9th October 1800 the French privateer *La Confiance*, commanded by Robert Suicout, the most famous and most daring of the French privateersmen in the East, took the East Indiaman *Kent* off the Sandheads, when almost in sight of port. This action is described by James, and also in the *Calcutta Gazette* of 14th October 1800. The passengers of the *Kent* were allowed to go in the boats. Among those wounded in the fighting were two young Assistant-Surgeons on their way out for the first time, Henry Gibson and Richard Sherwood. Gibson was appointed to the Bengal Army as Assistant-

Surgeon on 11th September 1799, he became Surgeon on 1st January 1813, and died on 19th July 1818. Sherwood was in the Madras service, his first commission is dated 29th April 1799, he was dangerously wounded, and had to be left on board the captured *Kent*, as a prisoner, but recovered, he became Surgeon on 24th September 1805, and retired on 5th January 1822. The difference in rapidity of promotion is worthy of note, it took Gibson over thirteen years to attain the rank of Surgeon, which Sherwood got in six years and a half. Neither was specially fortunate or specially unfortunate in his promotion, it is only that promotion, at the time, was running much more quickly in Madras than in Bengal.

On 21st June 1806 a new East Indiaman, making her first voyage, the *Warren Hastings*, was taken in the Indian Ocean, after a stiff fight, by the French frigate *Piémontaise*. Among the wounded on the Indiaman were both the Surgeon, John Baines (severely), and the Surgeon's Mate, James Greville. The *Piémontaise* herself was captured off Cape Comorin, nearly two years later, on 3rd March 1808, by the British frigate *San Lorenzo*. John Baines, the wounded Surgeon, was appointed an Assistant-Surgeon on the Bengal Establishment on 13th March 1808. He resigned, while on furlough in England, on 17th October 1815 but was reinstated on 25th June 1817, became Surgeon on 4th May 1822, retired on 14th July 1825, and died at Byfleet on 28th April 1847.

The names of the Great Proconsul have not been propitious to ships named after him. The Indiaman above mentioned was one of the finest vessels in the Company's fleet, and was making her first voyage. While only a few years ago the last and finest addition to the modern Indian Marine, also named *Warren Hastings*, was lost on Mauritius, while still quite a new boat.

The following letter from Andrew Baid, Surgeon of a captured Indiaman, the *Culland's Grove*, is preserved in the India Office —

"To Dr John Hunter, Physician to the Honorable East India Company

"Sir,—I have the honour to acquaint you that I was Surgeon of the Honorable Company's ship *Culland's Grove*, which was captured on the 22nd July 1803, and since that time I have been a prisoner of war in France.

"That unfortunate event has not only prevented me from returning to India, an Assistant-Surgeon on one of the Honorable Company's Establishments, but it has also deprived me of the means of subsisting myself by the exercise of my profession. After a period of three years' captivity, I hope it will not be considered premature to solicit the protection of the Honorable Company, nor presumptive to request the favour of being appointed an Assistant-Surgeon on one of their establishments, with the privilege of taking rank from the time of appointment. Convinced from the justice and generosity of

¹ I knew of no other reference to Murray's medical career.

the Honorable Court of Directors that it is only necessary that my unfortunate situation should be represented to them in order to obtain the favour I ask, I hope you will have the goodness to lay it before them as soon as convenient

"Your zeal for the interest of the department of the Honorable Company's affairs over which you preside, leaves me no room to doubt of your taking an early opportunity to comply with my request. I have the honour to be, Sir, Your most obedient servant, Andrew Baird Verduin in France,—15th May 1806"

The Dr John Hunter to whom this letter was addressed was Examining Physician to the East India Company in London, and held a position somewhat analogous to that of the President of the Medical Board of the India Office now. Medical Officers nominated to the Company's service appeared before him for examination as to their fitness, physical and professional, for their posts. He must not be confused with his more famous namesake, John Hunter, the anatomist and surgeon, who died on 16th October 1793. Dr Hunter forwarded Andrew Baird's letter with the following recommendation—

"Dear Sir,—The enclosed letters will explain themselves. You will judge whether it is best to lay them before the Committee of Shipping, or the Court of Directors. All I know of Mr Baird is that in March 1802 I examined him as Surgeon, and found him well qualified. I am, dear Sir, Yours sincerely, J Hunter Hill House, July 17th, 1806"

This letter bears no address, but presumably it was to Mr Millett, one of the Directors of the Company, for Baird's letter is endorsed "recommended for Bengal on my nomination, George Millett"

Baird's commission as Assistant Surgeon was dated 3rd February 1807, and he ranked from that date, while still vegetating at Verdun for some years. A letter from Court, dated 30th May 1810, published in the *Calcutta Gazette* of 20th December 1810, states that he had succeeded in escaping from Verdun, and had been permitted to proceed to Bengal. His career was short, for he died at Chittagong on 28th June 1812.

A work of the greatest interest to the medical officer in the R A M C or in the I M S is the autobiography of Sir James McGrigor, Director-General of the Army Medical Department.¹ McGrigor was born on 9th April 1771, entered the Army on 13th September 1793 as Assistant Surgeon to the newly raised DeBugh's regiment, afterwards the Connaught Rangers, served in Flanders in 1794-95, in the West Indies in 1795-96, India and Egypt in 1799 to 1801,

joined the Royal Horse Guards, the Blues, in 1802, became Deputy Inspector-General on 27th June 1805, and served in that rank in the Walcheren Expedition. He became Inspector-General on 25th August 1809, and served as Chief of the Medical Staff of Wellington's Army throughout the Peninsular War, being present at the sieges of Badajoz, Ciudad Rodrigo, and Burgos, the battles of Salamanca, Vittoria, the Pyrenees, and Toulouse. He retired in 1814, but was appointed Director-General of the A M D on 13th June 1815, and held that post for thirty-six years, till he retired in 1851. He was created a Baronet in September 1830, and K C B on 17th August 1850. He died in London, aged 87, on 2nd April 1858. A memoir of his life will be found in the *Dictionary of National Biography*, another in the *Lancet* of 10th April 1858. Besides his autobiography, published three years after his death, he was the author of a work entitled "Medical Sketches of the Expedition from India to Egypt"

When serving in India with the Connaught Rangers in 1799-1801, McGrigor was appointed Superintending Surgeon of the force sent under Baird to Egypt in the spring of 1801. As this force was composed of both King's and Company's troops, the E I Co gave McGrigor a temporary commission as a Superintending Surgeon in their service, that there might be no doubt as to his authority to issue orders to and to supervise the medical officers of the Company's service.

In the "Life of Sir David Baird," the following medical officers are mentioned as having crossed the desert, from Koseri to the Nile, with Baird's force in June 1801. All appear to have been in the King's Army—W R Shafter, Inspector of Hospitals, J Foreman, Surgeon to the forces, J Paterson, Field Apothecary, J Rice and T Price, Hospital Mates. Shafter was afterwards Inspector-General of Hospitals with Sir John Moore's Army in Spain in 1808-09. Among the medical officers of the I M S, who accompanied the Indian contingent to Egypt, were Hugh Lauder, Thomas Judson, James Small, and George Procter, all of the Bengal Medical Service.

While McGrigor was in India, a proposal was made, and for the time accepted, that a fourth Presidency should be formed, under the Government of India, to include the British possessions in the Malay Peninsula and Archipelago, with the seat of Government at Pulo Penang. Of this new Presidency, Dundas was to have been Governor, and the appointment of Senior Member of the Medical Board was offered to McGrigor, who, after consideration, declined it. As he says, the appointment of an outsider as the head of the Medical Service would have caused considerable dissatisfaction in the I M S. In the end the whole scheme was dropped.

Speaking of the services of the Medical Department in the Peninsular War, McGrigor says "During the late war the cases of wounded

¹ "The Autobiography and Services of Sir James McGrigor, Bart., late Director General of the Army Medical Department, with an appendix of notes and original correspondence." London: Longman, Green, Longman and Roberts & London, 1861.

medical officers were numerous. Some had been killed, and not a few lost limbs in sieges or in battles." Wellington's despatches from the Peninsula, copied from the *London Gazette*, are given at length in the *Gentleman's Magazine* for the time. In the despatches announcing the result of each battle are given the names of the officers killed and wounded. The only medical officer mentioned as killed in action throughout the war is Surgeon J. Bollman, on the staff of the Portuguese forces, killed at Albuera on 16th May 1811. In the previous fighting in the Low Countries, however, two medical officers were killed in action: Assistant-Surgeon H. Quin, of the 71st Foot, at Middleburg on 2nd August 1809, and Assistant-Surgeon Chislet, 81st Foot, at Flushing on 13th August 1809.

McGigoi states that, previous to the Peninsular War, the Medical Department had never been mentioned in despatches. After the siege of Badajoz, taken by storm on the night of 6th April 1812, McGigoi requested Wellington to mention the good work done by the Medical Department in his despatch announcing the capture of the fortress. Wellington asked him whether such mention was usual, and McGigoi admitted that it was not, but urged that the Medical Department had deserved mention for their services, and that the fact that they had not been mentioned in despatches before was no reason why they should not receive such honourable mention now. On consideration, Wellington agreed, and accordingly in his despatch makes mention of the good services of "Mr McGigoi and the medical gentlemen under his direction" (Despatch of 8th April 1812, *London Gazette*, 24th April 1812). They are mentioned again in the same terms after the battle of Salamanca (Despatch of 21st July 1812, *London Gazette*, 16th August 1812).

Presumably the services of medical officers had not previously been mentioned in despatches in European warfare. They had, however, met with recognition at an earlier date in the East. In the despatch, dated 21st July 1810, from Lieutenant-Colonel Keating, announcing the capture of the island of Bourbon, published in the *London Gazette* of 25th October 1810, among the officers mentioned are Superintendent Surgeon Harris, of the Madras Service, and Surgeon Davies, of the Bombay Establishment.

The honorary distinctions which fell to the lot of the Medical Department a century ago were few and far between. The only honours received by medical officers for services in the great war were the Knighthoods bestowed upon McGigoi and upon J. R. Grant, "Chief of the Medical Department of the Army lately employed in France and the Netherlands." The latter was not gazetted until 1819 (*London Gazette*, 10th April 1819), nearly four years after Waterloo. The K C B and Baronetcy bestowed upon McGigoi were not given till many years later. Honours of all kinds were then given

much more sparingly than now, a C B in 1804 was a rare distinction than a K C B in 1904. It was not until 1850 that departmental officers, including medical officers, were made eligible for appointment to the Order of the Bath. The *London Gazette* of 16th August 1850, which contains the notification of the extension of the Order, also publishes the names of three medical officers who were created K C B: Sir James McGigoi, Director-General of the A M D, Sir William Burnett, Director-General of the Medical Department of the Navy, and Inspector-General Sir James Thomson, of the Bengal Medical Service, also of seventeen to whom the C B was given. The latter include seven officers of the A M D, six in the Navy, and four in the I M S, viz, B W Macleod and C Renny, of Bengal, J Wylie, Madras, and C D Straker, Bombay.

Two officers of the I M S, or rather two officers who afterwards entered the I M S, served in the Peninsula and at Waterloo. Of these the best known is William Twining, who went out to Portugal as a Hospital Mate with Wellington's Army in 1810, was promoted to Assistant-Surgeon in 1814, and, after serving through the Peninsular campaigns, was present at Waterloo. He went to Ceylon as Surgeon to Sir Edward Paget, the Governor, in 1821, and afterwards accompanied him to India. He was appointed an Assistant-Surgeon in the Bengal Army on 12th August 1824, but did not resign his commission in the Royal Army till 1830, thus holding a commission as Assistant-Surgeon in both services simultaneously for six years. During most of his service in India he was on the staff of the Presidency European General Hospital, Calcutta, and died there on 25th August 1835. An oil painting of Twining hangs in the Medical College Hospital, Calcutta, and his tombstone may be seen in the South Park Street Cemetery in that City. There is a curious mistake in the epitaph, which says that he was born in 1780, and died on 25th August 1835, aged 45—an obvious error of ten years. The date of birth is incorrect, it should be 1790. Twining was the author of several works on tropical medicine, which were standard authorities in their day: "Diseases of the Spleen, particularly in Bengal," 1828, "Clinical Illustrations of the more important diseases of Bengal," 1832, second edition, 1835, and "A Practical Account of Epidemic Cholera," 1833.

The second, George Nicholas Cheek, also served in the Peninsula, and was present at the capture of San Sebastian and Orthez. He was also present at Waterloo, as may be seen from the following letter, preserved among the certificates of Assistant-Surgeons at the India Office:

"London, 10th April 1816. To the Hon'ble the East India Committee. Honourable Sirs,—I beg leave to inform you that the reason I cannot produce my diploma of having passed the College of Surgeons, as also my other certificates of

upon McGillivray were not given till many years later. Honours of all kinds were then given of Surgeons, as also my other certificates of

attendance at the hospitals, arises from my having lost the whole of them on service, with a part of my baggage, when on service in Holland at the battle of Waterloo. I have the list of the surgeons to produce, and also my commission, which I should never have obtained had I not produced the necessary certificates to the Army Medical Board. I have the honour to be, Honoured Sirs, your most obedient and devoted humble servant, George Nichls Cheek."

The commission Cheek speaks of was that of Assistant-Surgeon in the Army Medical Department, it was dated 19th July 1813, and signed by the Prince Regent. He received a commission from the E. I. Co. as Assistant-Surgeon in the Bengal Medical Service on 30th September 1816, and served in the Third Maratha War of 1817-18, being present at the siege and capture of Hathras. He soon, however, settled down in civil employ in Lower Bengal, being appointed Civil Assistant-Surgeon, first of Bardwan, and soon after of Bankura, then usually known as West Bardwan on the Jungle Mahals. Here he went in extensively for zamindari, indigo, and trade, and, when his turn came for promotion to Surgeon, gave up promotion in order to remain at Bankura as Civil Assistant-Surgeon. Here he spent the rest of his life. After over half a century of service in India as Assistant-Surgeon, he died, while on short leave at the Nilgiris, on 26th June 1859.

MOSQUITOS AND MALARIA IN FEROZEPORE DISTRICT, 1903

By J. R. ADIE, M.B.,

MAJOR, I.M.S.,

Civil Surgeon, Ferozepore.

"It is necessary that Paludism and the occurrence of anopheles should be studied more closely, and that their relation should be determined with the presence, the disappearance, the spontaneous diminution, the intermitting and the recrudescence of malaria—in short with all its autochthonous variations.—CELLI

The following species of *Anophelina* have been found in this district—

- 1 *Nyssorhynchus fuliginosus* (Giles)* Very common, including a "most quaint" winter variety
- 2 *Myzomyia culicifacies* (Giles)** Very common
- 3 *Nyssorhynchus Stephensi* (Liston) Very common¹³
- 4 *Myzomyia Rossi* (Giles) Very common.¹²
- 5 *Celia pulcherrima*. Very common⁴
- 6 *Myzomyia Turkhudi* (Liston) Three specimens only¹⁴
- 7 *Myzorrhynchus sinensis* (Wied) Three specimens only¹
- 8 *Nyssorhynchus Jamesi* (Theobald) Very scarce, three specimens⁶
- 9 *Nyssorhynchus Maculipalpis* One specimen⁷
- 10 *Myzorrhynchus barbirostris* (Wulp) Larva only found⁸

[* The figures following these names refer to the coloured illustrations in James and Liston's new monograph.—ED. I. M. G.]

(There are three more species in my collection—

M *fluviatilis*, Jhelum Road, Kashmir,

N *maculata*,

A *Litdesayi* in Badam, 6,500 feet Kangra)

Having given them their full new titles, omission of the generic name in these notes will leave much time

The accompanying Chart shows the seasonal variation of the *Anophelina*, rainfall, temperature, malaria cases, and parasites, during 1903

The diagrams bring out the following points—

1 The *Anophelina* do not all flourish at the same time

2 They flourish most in the rainy months, and a little before and after. But *fuliginosus*, *culicifacies*, *Stephensi* and *barbirostris* seem to occur independently of rain

3 *Fuliginosus* is peculiar. It includes (a) *fuliginosus* proper, which flourishes from about the middle of March to the beginning of January, and (b) a "most quaint" (as Theobald calls it) variety, whose points I will describe later, which flourishes from about the middle of November to the end of April

4 The species which is most numerous at one time is *Rossi*, but *culicifacies* comes very close

5 *Culicifacies* the accepted chief carrier of malaria in these parts, flourishes from May 1st to about the beginning of January. But one adult was caught on March 3rd and another on April 5th of the present year

6 In September the common species reach their highest numbers

7 *Rossi* considering its vast numbers, has a very short season—from the end of July to the middle of December

8 When *culicifacies* is scanty or absent, that most quaint variety of *fuliginosus* is in season. I have described in the *Indian Medical Gazette* how one of these latter was found to be harbouring sporozoites in the salivary glands (*Indian Medical Gazette*, July 1903)

Fuliginosus and *culicifacies* appear to have very similar seasons, the former is obtainable, practically, throughout the year, the latter nearly so. Both are found inhabiting the same roofs and rooms, and their larvae the same water

9 It would appear that one year is not sufficient for complete observations as to prevalence. The longer one searches, the more of course comes into one's collection. The only *Maculipalpis* was caught by the hand as I was hurriedly leaving a canal rest house in 1902. None since. The only three specimens of *Jamesi* were caught in the same year, the early two specimens of *culicifacies* (March 3rd and April 5th) in 1904, the three specimens of *sinensis* in 1903, and so on

10 The rain diagram shows July, August and September the most rainy months

11 The fever diagram shows October, November, September the most feverish months, in that order. This also applies to all my recording dispensaries. It agrees with the Malarial Fever figures of Mian Mir native troops, 1892-1901, quoted by S. P. James

12 The diagram for malarial parasites actually found in fever cases, follows (as expected) the fever line

Quartan occurs commonly throughout the year. It has been very common this spring (1904)

13 Combining the diagrams of the five common *Anophelina*, and, speaking generally, one finds that these mosquitoes are most prevalent in September, October, August, in order. It will of course be at once seen how this is separated exactly by one month from the fever prevalence, one month being the period required for the development of malaria in mosquito and man

Nearly 3,000 specimens of the *Anophelina* have been captured, of which over 2,000 are pinned, mounted and catalogued

Nyssorhynchus fuliginosus—This is the only species which lasts throughout the year. Adults are found in native dwelling houses, empty houses, cowsheds and out-

houses of all localities, in the city, in hamlets and isolated houses all round the city, and in the Police Lines. A cow house, near a big well, is almost always a successful hunting ground. These mosquitos like *serik* roofs, and do not object very much to cobwebs. They fly with great adroitness in a room thick with cobwebs without tripping, they even will settle on a cobweb, but in this case one generally finds no spider is near. I have in vain tried to see a spider capture a mosquito. It is hardly necessary to say, these cow houses are generally dark and dirty. They were found in large numbers in the stables of a native gentleman, who lived near the city. These mosquitos do not fly far when disturbed thus differing greatly from *Culex* as a rule. In the cold season, they are very dull and lazy, their capture is very easy, when disturbed they hardly trouble to move, they hide away in the recesses of old cracks in the walls, or in corners between wall and roof, in one cow-house, where only cows slept, they were found gorged on the walls. The dwelling houses of men are not favoured on account of the smoke from cooking. This species is remarkable as having a variety with four white bands on the palps and two pure white hind tarsi. I sent specimens to Theobald, who says it is a "most quaint" variety of *N. fuliginosus*. It is only found in the cold weather months, and then only in moderate numbers. It was only obtainable from a certain spot, namely, the Dhoby Ghat, on the far side of the city.

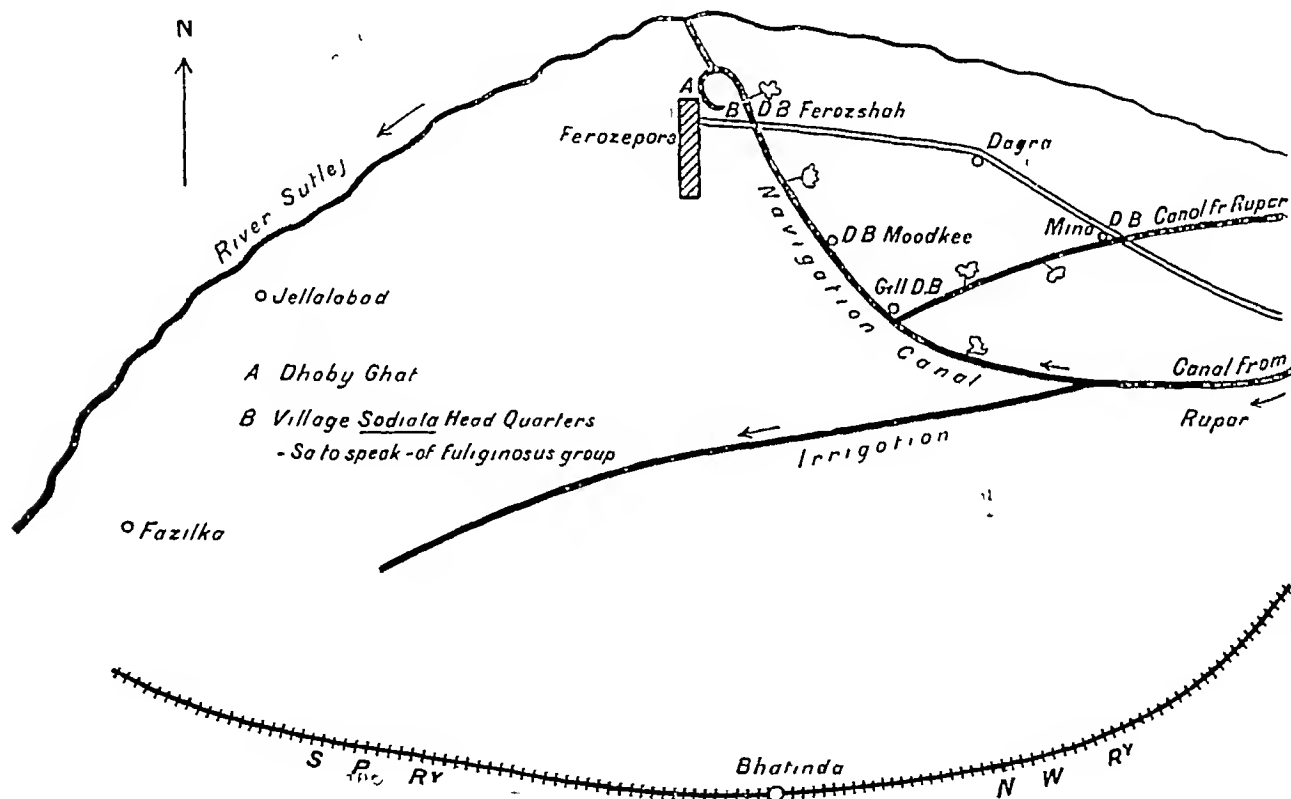
and there is generally 3 or 4 feet of water. Weed is abundant, and water is clear.

Fuliginosus is common all round the Dhoby Ghat, and its larvæ flourish among the weeds of the canal throughout the year. In the cold weather, no other kind of larva has been found either in these waters or anywhere else, although I have searched the mud at the bottom.

On the 5th April, 1903, I came across a larva of *Myzorrhynchus barbirostris* in the Dhoby Canal, but I have never been able to capture an adult. The larva was mounted, and so could not be hatched out. *Culicifacies* larvæ are also common in this ghat in the warmer months.

To illustrate the close relation between Canals and *Anopheles*, I devoted my fortnight's sanitary tour to those parts traversed by the navigation canal, and found the results very interesting. I add these notes in diary form.

27th April 1903 *Ferozeshah*—Canal contains 1 foot water, clear, and gently flowing. Edges covered with small grass. Very careful examination showed young *Anopheles* larvæ in stream, both in middle and at edges, but chiefly at edges in the tiny gulfs and bays. Explored cattle tanks fed by canal. Plenty of larvæ (*fuliginosus*), some quite young others old. Searched surroundings of a well, 50 yards off and unconnected, with canal. Negative. Nearest villages $\frac{1}{2}$ mile



The above rough sketch may help the study of the subject. The district may be taken as an oval. Its north boundary is the R. Sutlej, its south boundary, roughly, the S. P. Railway and Rupar Railway. A large canal from Rupar enters the district at its eastern border, and soon divides into two branches. One goes north, and is a navigation canal, while the other goes west and is for irrigation. The northern navigation branch passes the dâk bungalows of Gill, Moodki and Ferozeshah, and ends in the river, but a considerable channel turns at A by the side of the city, and ends in a cul de sac. Here there is a rough sort of landing place, which is chiefly used by city dhobies, hence called Dhoby Ghat.

The canal here is of large size, to allow big-boats to pass, perhaps 20 yards wide. It has high strong banks,

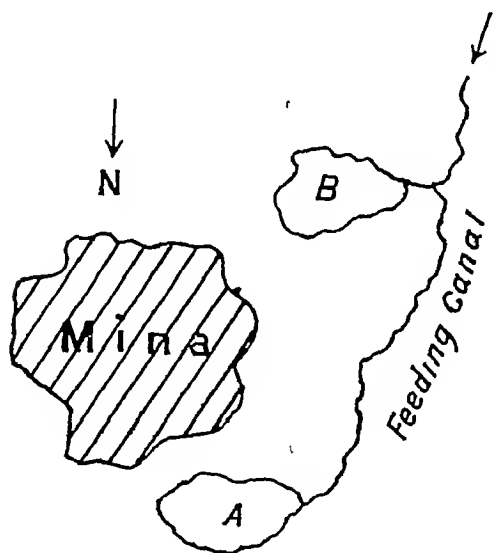
28th April, 1903 *Dagra*, on G. T. R.—Examined shallow ponds—*chuppris* and wells. Negative. No adults in village. Had just been good showers.

At dusk heard "mosquito hum" in dâk bungalow, but not due to mosquitos, but to a small kind of fly.

29th April, 1903 *Mina* (41 miles from Ferozepore)—Village has four *Chuppris*, of which I explored two, A and B. In A easily found several of old Dhoby Ghat kind (*fuliginosus*). Very plentiful in canal distributary which fed the *chuppris*. A was filled ten days ago. Also found in B.

One ♀ adult *fuliginosus* was found in the village. 30th April, 1903 *Gill* (on the Navigation Canal)—Lock with usual number of isolated ditches and pools. Several larvæ collected, mostly of the *fuliginosus* species, but also *Culicifacies* and three ♂ *Culicifacies* adults.

captured in out offices on 1st May (first of season)
More taken later—all culicifacies except one ♀ *Step*
ensi. Collected many larvæ



5th May, 1903 *Moodki*—Several adult culicifacies captured, and larvæ mounted

7th May, 1903—Moved on

Conclusion—*Fuliginosus* and culicifacies larvæ very common all over the canal, and its distributaries, *chuppris*, and ditches. Larvæ of *Myzomyia Turkhndi* also met with. The only common adult is culicifacies. In short it is clear that canals are responsible at that time of year for vast numbers of *fuliginosus* and culicifacies—the two most important *Anophelina* in the district.

It is well known how canals are also responsible for culicifacies in the warmer months.

Leaving this digression, I return to the subject of where this mosquito is captured. The Police Lines are always safe for a good haul except during the cold weather. During this time I have tried the white sheet and smoking out experiment, but failed to capture any. In the very cold weather it is only obtainable near the Dhoby Ghat, and Sodhala village is usually a safe find.

A few have been found in the Jail near the Paper Factory, and also in the Fort ditch.

From the Chart it will be seen that this species gets rather uncommon in June and July, before it reaches the monsoon high mark. I cannot think why this is, but it is noticeable that culicifacies has by that time become quite numerous.

Time of reproduction—14th February to 9th April (eggs), 5th April to 1st May (nymphæ).

See 'Note on *A. fuliginosus* and Sporozoites,' *I M G*, July, 1903.

Myzomyia Culicifacies—This species comes in on the 1st of May, and goes out about the end of December. While in season it is extremely common. Its haunts are about the same as *N. fuliginosus*—dwelling houses and huts in city, around city, low lying huts near Dhoby Ghat, huts and villages near Ferozepore, cattle sheds, stables, police lines, serais, branch dispensaries, travellers' bungalows and their out houses (including canal houses). The insects rest chiefly on the roofs, but are often seen on walls, even on freshly lime washed walls. The Nawab's *kothi* at Jellalabad contained large numbers in November.

Larvæ are most easily obtained, they occur in all kinds of ponds—*diggis* and *chuppris*. The Dhoby Canal has multitudes, so also navigation and irrigation channels and their dependences, leakages, and garden drains, strings of roadside pools after rain or flooding commonly contain them, and I have found them in the Fort ditch.

The town of Jellalabad (6,000 population) depends, for drinking water, almost entirely on shallow irregular *chuppris* outside the walls which are periodically filled by canal water perhaps twice a year or so. The water is at rest—no stream. These *chuppris* are crammed with culicifacies larvæ even in November (the time of examination). At the same time adults were plentiful everywhere in the town, and fever was very severe among the children.

Larvæ were also found in a small tank behind the jail, in ditches in the Deputy Commissioner's house, and in various runnels in the church compound.

On the same visit I explored Fazilka, a town of about 8,000 population, where drinking water is obtained chiefly from wells.

I examined 151 children of the school, and 124 in a poor quarter of the town, with reference to splenic enlargement (owing to plague operations it was thought inadvisable to take blood films) and found that no less than 58% of the former and 52% of the latter enlarged spleen. I then searched for anopheles, and was not a little surprised at the results. In the rest house they were fairly common, and I captured a score (chiefly males) easily. But after I had searched the quarter where the sickly children lived for 2½ hours, I found nothing more than one *pulcherrima*. Nor could I find a larva in the many drains, puddles and runnels which were examined of one could not enter into private apartments. That was on the 4th December I regret I had not time to search further. I have noticed the first and last captures of their season contain mostly males.

Although the attitude of *Myzomyia Culicifacies* is very like that of a *Culex*, my collectors and I, myself, have not felt very great difficulty in "spotting" them. A male is quite easy to recognise on account of its slender proportions, its parallelism with the wall (distance from wall equals length of abdomen), and the peculiar appearance given by the delicate spread out legs. The female is not crouched up, or humpbacked like a *Culex*, and its palpi are fairly visible, it takes short flights on being disturbed (a *Culex* takes longer flights). It looks more plump than *Culex*. The legs of this species are often slightly banded. Some specimens are light and others dark coloured. The musical note varies a good deal.

Aysorhynchus Stephensii, syn *A. metaboles* (Theob.) [I sent two specimens of this mosquito to Theobald, who calls them *Celia Kochu* Douitz. To clear up any possible doubt I will write again.]

This species comes in early in May and retires about the middle of November. It is at no time so numerous as *Culicifacies*, *Rossi*, *fuliginosus* or *pulcherrima*.

It has been captured in huts and dwellings in Sodhala (and other villages) Police Lines, Sadr bazar, race course, paper factory of jail, garden huts, and stables.

Larvæ are plentiful in garden *howds*, and canals and their dependences, wayside ditches, Fort ditch, shallow ditches by side of Sutlej river, pond behind jail.

Reproduction—

15-5-03	Eggs laid in straps of 12 or 16 or so
18-5-03	Larvæ
1-6-03	Flourishing
9-6-03	Some living and well
15-6-03	Returned from camp—all death

The musical note given out during flight is rather high pitched.

Myzomyia Rossi—This, while it lasts, is the most common of the *Anophelina*, but its season is a very short one. It first appeared on 21st July, in 1903, and went out about the end of December. In September and October it can be caught in any quantity. The adult is found in rooms, huts and out-offices of town and village, Police Lines, Sadr bazar, inside paper-factory of jail, quite common in *dâk* bungalows, in shelves or dark bathrooms, in stables, empty barracks, godowns, servants' quarters and cow-houses, and in Europeans' houses.

The larvæ are found in garden *howds*, any collections of water, runnels from wells, ditches outside villages, Fort, ditch, and roadside drains after rain, nullas containing water, borrow pits, water *ghurras* against fire, ditches by the side of dhoby tanks, tanks fed by canals. Some specimens are very dark coloured, while others are pale. There are small variations in the wing marks, and in the width of the tarsal bands. The palpi have a peculiar gentle curve (with concavity forward) which often is enough to distinguish the species.

Celia pulcherrima—This is a fairly common species in Ferozepore District, and is found between July and November in the following places—Most villages round the city, houses in the city, a few in the jail, plentiful in Police Lines and Sadr bazar, one in my bath room, one in my dressing room and one in verandah. In November I have found them associated with culicifacies.

Breeding out dates are—

9th Sept. '02	Gravid females placed on water	
10th " "	Eggs, groups like diphtheria bacilli, or in parade order	
12th " "	hatched	
	Mothers partly devoured by larvæ	
21st " "	1 pupa.	
6th Oct. "	1 ♀ imago	26 days
7th " "	1 ♂ "	27 "

The other species found in this district occur in very small numbers.

Myzomyia Trichuda—

One adult in Police Lines, October 1902
Sadr Bazar " "
Larvæ in Navigation Canal " "

Myzorrhynchus Sinensis—Found in October—one in dwelling house, one found sitting on my work table early morning (would not lay eggs), one in stables of a gentleman.

Very large insect—6½ mm tip of head to tip of abdomen
8½ " " of proboscis to tip of abdomen

(Giles mentions—only one measuring 6 mm—*pseudopictus*)
The second specimen laid a few eggs which, however, sank to the bottom of the vessel, and did not develop.

Nysorrhynchus Jamesi—Three adults

- (1) August 1902, in a neighbouring village,
- (2) One in my out-officers,
- (3) One in Police Lines.

Nysorrhynchus Maculipalpis—One specimen caught in first at a Canal bungalow, Rampura Phul, November 1902.

Nysorrhynchus barbirostris—Only larva form from Dhoby Ghat, April 1902. Easily recognised by characteristic frontal hairs.

Several questions occur to one on contemplating the Chart above given.

1. What becomes of adults and larvæ in the off season of each species?
2. Why have some longer seasons than others?
3. What relation have the important ones to rainfall and canal flow?
4. What is their relation to fever, and to the varieties of parasites?
5. What is the explanation of fever cases outside the high-fever mark in October and November? Are they relapses, or new infections, or both?
6. What differences occur in other parts of India with regard to seasonal prevalence?

1. As to the disappearance of *Anopheles* in their off seasons, it is said they might hibernate, or migrate, or exist only as larvæ and eggs. Major Herbert has made some important observations on the remarkable vitality of young larvæ in mud. I have suspected resting larvæ and eggs in the mud of our Dhoby Canal, but have in vain examined large quantities of wet mud in their search. As to some adults seeking shelter in houses during the winter. I have seen no convincing

proofs against this possibility. I know that sulphur cones burnt in a closed room are fatal to mosquitoes, and that when this test has been tried in a room and no dead mosquitoes have been discovered, it has been concluded no mosquitoes could have sheltered therein. Considering the complicated, meandering, sheltered, closed at one end crevices which one sees in old tumble down huts made of cracked mud, and the fact that it must be difficult for fumes to penetrate these small tortuous passages, it is quite possible some *Anopheles* survive in that sort of seclusion. Even supposing they had been killed by the fumes, it does not follow they would be found lying dead on the floor of the room.

In this connection I would note that as the cold weather approaches, one has to search more and more carefully for adults and instead of seeing them on walls and roofs, one has to look into cracks and corners, and later to poke about more systematically with a prodder into holes and fissures to effect captures. Why is it not possible that in still colder weather they push farther in out of our reach, thence to dwell in warmth and safety?

I have tried to imitate crevices by arranging test tubes containing mosquitoes and covered with net, at various depths away from the wall, among books, bottles, boxes, &c. These have withstood the burning of sulphur cones. Could some physicist kindly demonstrate whether diffusion would be so complete in such cases as to reach the farthest recesses of cracks and fissures in the mud walls of native huts?

In the first captures of a season one might get a hint on this subject by examining the salivary glands for it is possible to distinguish the glands of a newborn from those of an old mosquito. Some culicifacies I have examined lately (may) have appeared (from this point of view) to be old hands, but I have not examined a sufficient number of such to draw a conclusion.

I have noticed among culicifacies males preponderate when the species is coming in and going out of season.

As before stated my seasonal prevalence diagram of culicifacies is, from the experience of two years, May 1st to end of December. So we must suppose that in the off season, culicifacies continues either as hidden adults or immature larvæ, or both. From the chart I would conclude March and April were in the off season. Yet two specimens were captured, one on March 3rd, and the other on April 5th, 1904 in this place. This at least proves we should not be in a hurry in defining the limits of prevalence.

2. Why have some species longer seasons than others? Climate and therefore water and temperature of course play the most important part. *Fuliginosus* is the only species here which lasts throughout the year, but it tides over the very cold weather in the garb of a winter variety. Culicifacies vary nearly lasts throughout the year, and both these species flourish in canal waters. It would be interesting to know why a *fuliginosus* is better able to get through the winter with four white palpal bands and two white hind tarsi than with the ordinary three white bands and three white tarsi. Is it that in their winter retreats, in those dark tortuous mud cracks spoken of, four bands would be more useful for recognition, and white dangling tarsi of no account?

3. What relation have the important ones to rainfall and canal flow? The short and crowded season enjoyed by *Rossii* is very remarkable. It and *pulcherrima* seem to follow and slightly outstay the rains. As regards numbers, culicifacies runs its very close in September.

James thinks *Rossii* depends on rains and culicifacies on canals, and the experience here appears to agree with this. I would add *fuliginosus* also depends on canals and stagnant back-waters the results of canals.

Stephensi begins before the monsoon, about the same time as culicifacies but has a shorter season.

The other five *Anopheles* of this district appear to be curiosities—their numbers are so small, but they all occurred in the dangerous months—September, October and November.

It might be here pointed out what a difference locality makes, *eg*, in Mian Mir culicifacies is most prevalent in October and November, whereas my Chart shows August and September

4 What is their relation to fever? This of course includes several questions

I Does the prevalence of *Anopheles*, generally, correspond with the prevalence of fever?

II Does the prevalence of culicifacies (or any other species) correspond to the prevalence of fever?

Regarding the first point, S P James has gone into this matter for Mian Mir (*Sci Mem*, VI—(parts I & II))

Chart II shows *Anopheles* curve, highest in order

	September	{ August
		Oct (equal)
Fever curve, highest in order	Oct., Nov., Sept.	
Fresh infections	Oct., Sept., Nov.	

There is thus a distinct correspondence, as the fever rise follows the *Anopheles* rise by about a month

My experience in Ferozepore is precisely the same, for by compounding the prevalences, so to speak, of the five common *Anopheles* found in this district—these are most numerous in September, October, August, in that order

Fever cases in Ferozepore are most numerous in October, November, September, in that order, that is, a month later

From James's Chart it appears that, although there are some *Anopheles* found in November and December, these have nothing to do with fresh infections, as the fever shown in November, December and January are, he states, relapses. In this connection I have not had the time to systematically examine children (the fresh infection test), but I have come across in the jail, in December, sharp malarial attacks (with parasites) of precisely the same character as I saw in October and November, and have been inclined to call them fresh infections, as most of them had had prophylactic quinine for a considerable time

Why should fresh infections close before *Anopheles*? Of course, this opens up the whole difficulty of relapses

Question II—Does the prevalence of culicifacies (or any other species) correspond to the prevalence of fever?

Naturally, all interest centres round culicifacies, the only malaria carrier in Mian Mir, and there ought therefore to be a correspondence

James says in his foot note on page 11—"It will be noted on comparing Charts I and II that the fever curve is dependent on the seasonal prevalence of *A. culicifacies* rather than on that of *A. Rossi*, for the latter species does not commence to be prevalent until new infections have already begun" He admits that his culicifacies curve does not fit the fever curve

To compare his Charts I and II is rather difficult, so I have for my own study diagrammed his curves

It will be noticed that his maximum of fever is about the middle of October (My fever curve agrees), his culicifacies curve is highest between October and November and does not agree with mine. Neither of our culicifacies curves agrees with the fever curve, and as this species is the only malaria carrier in Mian Mir the circumstance requires explanation

Is it on account of irregular infectivity of culicifacies? Or, have we insufficient data regarding the prevalence of this species? Is culicifacies really the only malaria carrier in these parts?

As to the first, perhaps meteorological conditions might interfere. Regarding the sufficiency of data, do we know enough about seasonal prevalence of the *Anopheles* (and especially of culicifacies) from which to draw conclusions? It takes a considerable amount of time, patience and knack to collect this species, as it resembles *Culex* so much. Supposing, then, our respective collections were weak, and we were to combine them, and see how the curve works out. The order of prevalence thus appears September, October, August—which is just what we want, as this would account for high fever a month after, namely, October, November,

September (This might look like cooking, but it is correct)

Next, is culicifacies the only malaria carrier in these parts? Is there any other curve of species corresponding with the fever curve? *Fuliginosus* certainly does, so do *pulcherrima* and *Stephensi*. Of these, the last two are not nearly so numerous as *Rossi*, culicifacies and *fuliginosus*. *Fuliginosus* persists in the adult and larval forms throughout the year, and I have found one infected with sporozoites in April, when no other adult species of *Anopheles* was visible. Collecting, and dissecting of salivary glands take up a deal of time, which can with difficulty be spared by a Civil Surgeon. I have examined the salivary glands of 148 *fuliginosus* with one infection, and of 43 culicifacies with none. When one thinks 6 or 8 per cent of infected *Anopheles* is considered a heavy infection, one can realise what a vast quantity of work remains to be done on this subject

Of 71 stomachs examined, four had zygotes, and these were crescent fed cases

Of 204 salivary glands examined, one had sporozoites (natural state)

The finding of infection in mosquitoes is thus seen to be both laborious and depressing, for one positive result in 200 dissections involving the use of the microscope cannot be said to be exciting. Supposing *fuliginosus* were a mild carrier, this might explain, in part, the incidence of fever throughout the year, but it is also possible culicifacies exists in the adult from throughout the year (February being the only month in which I have not witnessed the capture of an adult) and also plays a similar part. But here we come upon the large subject of relapse again

On combining my diagrams of culicifacies (a certain carrier) and *fuliginosus* (a possible carrier) I find their combined order of prevalence to be August, September, October, July, which corresponds fairly with the fever curve

On combining my culicifacies and *fuliginosus* curves, and James's culicifacies curve, the result corresponds exactly with the fever curve

I may mention incidentally, culicifacies and *fuliginosus* are closely associated in their habits, living in the same houses, rooms, roofs, being captured at the same times, and their larvae occupying the same waters

5 What is the explanation of fever cases outside the high fever mark of October, November and September? Are they relapses, or fresh infections? James says—"From a consideration of the above table we may say that the season of new infections in Mian Mir, begins at the end of July or the beginning of August, and that the number of new infections increases steadily until it reaches a maximum in October. As soon as the endemic index begins to decrease it may be assumed that new infections have ceased, and the sudden fall in the percentage of infected children in November affords a proof of this. From November until July of the next year any cases that occur are relapses of former infections" (*P 8, Sci Mem No 6*)

According to his rule, the endemic index of November, namely, 27 (Chart II) is due to relapses. This seems very high compared with the ordinary endemic index of eight in June and July quoted in table, page 7

Again I quote from page 12, "and in November with the almost sudden disappearance of adult *Anopheles* mosquitoes the endemic index quickly fell" Why should fresh infections follow *Anopheles* by a month in the upward part of the curve, yet disappear with them?

As October is one of the richest months in culicifacies, one might expect November to be severely afflicted with fresh infections, and the fever curve and endemic index curve point to this. Yet James says November infections are relapses. Thus, if that is so, the high prevalence of *Anopheles* and culicifacies in October becomes meaningless. What has produced relapse in 19% of the children in November? If cold, why not the same in other cold months? Reckoning September as about the richest month in culicifacies (combined figures) October

Table showing dates of dissection, 1903

		January	February	March	April	May	June	July	August	September	October	November	December	Total	
IN NATURAL STATE	Culicifacies	{	Stomach			5	1		2					8	S Sporozoite
						9	3		5	14	.			32	
	Fuliginosus	{	Stomach		2	4	8			4	2			20	
					4	S 30	19	1	2	33	22	10		122	
	Stephensi	{	Stomach												
	Pulcherrima	{	Stomach												
	Rossi	{	Stomach												
FED ON OBESCENT CASES	Culicifacies	{	Stomach												Z-Zygote
	Fuliginosus	{	Stomach												
	Rossi	{	Stomach												
	Culicifacies	{	Stomach								4	Z 5		10	
											8	3		11	
	Fuliginosus	{	Stomach								5	ZZZ		30	
											5	21		26	
	Rossi	{	Stomach												
											1			1	

gets the highest endemic index as might be expected, but I cannot understand why, if culicifacies remain high in October, the endemic index of November (27) should not be counted fresh infections, at any rate in part.

If James's definition is correct, more than half the children in Syce Lines A, in November 1901, suffered from relapses (upper table 7). But the following words—"... and it is evident that in the months in which the examinations were made [October and November] malarial fevers are very prevalent in Mian Mir, and the liability to infection very great"—would seem to admit the possibility of fresh infections in November.

Another point is, supposing by dissection between October and June a certain percentage of Anopheles are found infected, what is to prevent their infecting man and producing fever from November to July, in the same manner as infected mosquitos do in the period August to October?

It would be most useful to know the prevalence and infectivity of all species throughout the year in different localities.

Again, James, page 13, describes the result of Anopheles destruction, and makes the following comparison—

Syce Lines A—in ordinary state, Nov 1901, E I 56.5
 „ without anopheles, „ 1902, E I 4
 See also pp 36, 45

Allowing this 4% as relapses, or uncured cases (as there were no Anopheles) in November, 1902, the endemic index of November 1901 must surely have been at any rate partly due to fresh infections. Else, how is it in the year of experiment (1902) not a single adult had malaria, and only one child out of 25 examined had parasites? And the only differences in

living were absence of Anopheles, and the men were really more exposed to sun and rain.

I cannot realise how such a sudden drop like this can be due to a drop in relapses. If a marked and quick reduction in malaria is due to a marked reduction of anopheles prevalence, this must mean a marked reduction in the number of fresh infections.

It seems a pity we have to recognise relapses at all, it leads very often to luke warmness in fighting Anopheles.

I have been comparing a few figures, very roughly, of course—

(a) Supposing malaria consisted only of fresh infections and uncured malaria, what amount of infection should be met with in dissecting Anopheles in the off-season?

I use the figures given by James and Stephens and Christophers.

Reckoning the figures at Mian Mir, Duars, and Funnur, an endemic index of eight would require about eight infected malaria carriers in 1,000. Reckoning Mian Mir only, the same index would require about six infected carriers per 1,000.

Averaging these, we might say that an endemic index of eight acquired by fresh infections would need seven infected malaria carriers per 1,000.

It will be seen that to prove this by actual dissection would be a large and difficult undertaking, especially as in some months the number of adults obtainable is so small. But it seems equally difficult to prove that the endemic index eight is not due to fresh infections from seven per 1,000 of malaria carriers.

It is clear we need more work in this line

- (b) Table, page 6, showing admission rates of Native Troops in Mian Mir, 1892-1901 I have drawn the averages, thus—

January	17		
February	9	Total admissions	400
March	9	Admitted in August	
April	16	September	198
May	23	October	
June	16	(Period of new infections)	
July	18		
August	36	In all other months	202
September	57		
October	105	Average for months in	
November	60	9 months of off season	22
December	34		

Therefore the numbers of fresh infections in August, September, October = 198-66 (i.e., 3×22) = 132

Thus the proportion of fresh infections to total cases of malaria is $132/400 = 1/3$

In other words it would appear only one third of the total malaria cases among Mian Mir Native troops was due to fresh infections, and two thirds of the fever there are due to "relapses" and consequently have nothing to do with mosquitos

This seems rather surprising

How is one to reconcile this with the Syce Lanes A Experiment?

It will be remembered, a community, *plus* Anopheles has in October 1901, an endemic index 66. The same community, *minus* Anopheles (and I might add *plus* exposure to rain and heat) in October 1902 has an endemic index of 4—is in fact practically free from fever. What has become of the relapses in spite of the exposure to rain these men were subject to (There was not a single case of malaria among the adults)

To my thinking, this experiment teaches us not to put too much faith in relapses. Indeed, James himself says on page 45 "This experiment proves that, if it is possible to do away entirely with breeding places of Anopheles in any place, malaria quickly disappears." Malaria is the word he uses, not fresh infections

One would like to hear the further progress of that experiment

- (c) Compare the amount of quinine given for malaria now with what it was 20 years ago

At the latter period (of course practice varied), I suppose many a case took no more than 120 grains. Now Ross lays down a dosage of about 1,000 grains! And this does not include prophylactic use of the drug

Is it then difficult to understand how many millions of cases have in previous years been simply tinkering with the drug, and how they must have gone about their business uncured, and how, when facing a cold east wind in Europe, they have been liable to an exacerbation?

Relapses are said to be due to resting parasites in internal organs. I have not come across any evidence of this. One might fairly expect it, as malaria is so common, and our modern systematic *post-mortem* examinations so thorough. Most of us have come across cases of malaria which intelligent patients cannot trace back to previous attacks, or to exciting causes, such as fatigue, rheumatism etc, but of course the usual explanation is they do not remember the attack they must have had

Celli, in reviewing the Transactions of the Society for Studying Malaria (*Lancet*, June 27th, 1903) says, there is wanted a diagnosis between fresh infections and relapses, and an explanation of a relapse itself

My own impression is that as —

(a) Adult *culex* species, the ordinary malarial carriers have been met with very nearly throughout the year, and possibly exist throughout the year

(b) Adult *fuliginosus*, at least a possible carrier, is certainly found throughout the year

(c) Malarial cases with parasites are met with throughout the year

(d) Malaria disappears quickly after disappearance of *Anopheles*, of Syce Lanes, Ismailia, Havana—my impression is malarial fever, between November and July can be the result of fresh infections, and not of relapses alone, and the fact that conditions (a) and (b) are intensified in August, September, October, and associated with intensified fever in September, October, November is, I think, something—perhaps not much—to be said in favour of that impression

We have all heard of old malarial cases having attacks of ague long after their return to England and we are in the habit of calling them relapses. Are not some of these really uncured malaria?

I came across an Indian Army officer in the Alps in winter, whom I examined for "permission to return to duty." He had had bad fever in Burma, but was at that time, he declared, free of fever, and in excellent health, and was most active in all Alpine sports. I examined his blood and found numerous Tertian parasites. On questioning him, I found he had quite neglected quinine. If any depressing cause had fanned up a "go of fever," this would certainly have been classed as 'one of those curious European relapses,' whereas it was a pure case of uncured malaria

6 As to the question what differences occur with regard to seasonal prevalence in other parts of India, nothing short of patient work all over the country will give this important information. I note in Captain Water's experience in the Andamans, malaria is extremely common and the only or chief *Anopheles* (I think he said only) is *Rossii*, which we know to be harmless in Mian Mir, Calcutta, and other parts. How is Andaman malaria to be accounted for? Are they all relapses, or is the malaria carrying mosquitos not yet discovered there?

Malaria—A serious attempt has been made to correctly diagnose malarial cases by the microscope, and only positively diagnosed cases have been returned as malaria in Jail Records. One has good control in jail and Police Hospitals, and my rule is no patient with a rise of temperature is given quinine without his blood film being taken, and without my express order. In jail work, the prophylactic issue of quinine undoubtedly interferes with parasite hunting, and in the Police Hospital I have sometimes had the misfortune to have a first grade fossil, who will not get into new ways. Some of the Hospital Assistants in my district are quite expert in film-making—Maurer's method of using one edge of a slide to spread the blood being the favourite one. The stain I use mostly is Romanowsky. In my opinion it gives safe, certain and beautiful results, and when one is in the routine of examining films every day there is no great urgency about coming to a diagnosis. When in a hurry, Leishman's stain is used. Some bottles of this stain obtained from Grüber have not been strong enough in blue and it has been necessary to add a drop or two of the stock Romanowsky blue to Leishman's stain in order to bring out the characteristic ruby colouring. For the Romanowsky's stain one consignment of powders from Grüber will probably be sufficient for years. I have never had any difficulty with this stain. For fixing I have wide bottles of absolute alcohol (from Walde & Co.)

For bringing out eosinophiles, eosin and methylene blue (separate staining) is our favourite method

Diagnosis is founded on the presence of parasites, pigmented mononuclears, and on an excessive proportion of mononuclears. As to this last test there is only one thing unsatisfactory about it, and that is the time it takes to apply. For accurate work one is required to

count 1,000 leucocytes (Stephen's and Christopher's "Practical Study of Malaria"), an operation which would take about one hour's hard work. I have generally been content with 300 or so. I have often, however, been able to recognise by "a glance" a substantial mononuclear increase, and verified it afterwards by a count. I always begin the examination on a film with a $\frac{2}{3}$ objective and No 4 E.P., this enables one to recognise roughly the proportion of leucocytes, and all parasites which are not very young, while it is the quickest way of getting an idea of the number of crescents.

Reckoning from February 17th, 1903, to February 10th, 1904—very nearly a year, the blood of 260 individuals has been examined. Generally two films are taken of each case. Sometimes, as in a doubtful case, or when watching crescent cases every day, many specimens were made from the same patient. The results are as follows—

Quartan	9
Tertian	12
Irregular	52
Diagnosed by mononuclear and pigment test	9
	—
TOTAL	82
	—

That is to say, of 260 individuals complaining of fever or having pyrexia, $31\frac{1}{2}$ per cent had microscopic evidence of malaria ($\frac{2}{3}$ ths of these had parasites). They included all prisoners with pyrexia, some police men, patients at Civil Hospital, and a few private cases, only a few children were examined. The mononuclear test was often verified in following up crescent and other cases which had in time lost their parasites.

During the year 1904, the Municipality and District Board (with public subscription thrown in) have built a new operation room, a microscope room and an ophthalmic room. The microscope room is provided with a £20 Swift's Microscope and all necessary staining agents and apparatus, and I have endeavoured to teach my subordinates the importance of blood examination. Some are keen, others I regret are not.

Quartan Fever—Films from such cases show the best sporocytes. It is curious to note how Quartan does occur in this district, as James has not come across it, in all his wide experience, in Mian Mir, which is only 50 miles distant. Why this should be so remains to be explained. In the two places, the rainfall is about the same, temperature and climate generally the same, *Myzomyia culicifacies* and *Myzomyia Rossi* are equally common in both. James has lately (Antimalarial Operations, *Sci. Mem.*, 1903) gone thoroughly into those two species, but he does not mention if the other four (which are found in Mian Mir) are very numerous. Here, it will be seen from the Chart how plentiful *N. fuliginosus*, *N. Stephensi* and *C. pulcher rima* are. *M. Sinensis*, on the other hand is extremely rare. The Temperature Charts in those cases of Quartan which could be followed out were quite book like in regularity.

These quartan cases occurred in February, 1 (Civil Hospital), May, 1 (Police), July, 6, (Civil Hospital 5, Police 1), September, 1 (Civil Hospital). No case occurred in the jail. Patients are well aware of the periodicity, and they complain of "Chowtha"—"fourth day [fever]". Quartan is easily controlled by quinine. Perhaps this accounts for no cases in the jail during the Prophylactic Period.

Tertian—Twelve cases only, which had parasites. One case in February, three in May, two in July, two in September, two in October, and two in November. Nearly all belonged to the Jail. Speaking generally, all films were taken when fever was on. Good sporocytes were uncommon, the most common parasite being the large immature irregular shape amoeba, with Schuffner's dots.

Irregular Malaria (Malignant Tertian)—In all 52 cases the microscopic signs were small rings and crescents. I have only been fortunate enough to get a few typical malignant tertian charts, but this may be due to the

general practice of most people "taking prophylactic quinine."

Practically all the cases occurred in the later months of the year, September, October (worst) November. So that, as the Italians call it Summer-Autumn fever, we might call it Autumn-Winter fever. There were several cases of combined Malignant and Simple Tertian.

By far the most interesting cases were those with crescents. The first crescent case I came across was at the Civil Hospital on September 22nd. (Had had irregular fever for one month—films crammed with crescents and young rings.) A month later, we had our first case in the jail October 21st. (Man said he had had chills for several days—temperature 100—film showed crescents, rings, and pigmented mononuclears.) Then came a regular crop of cases, which were kept isolated and known as the crescent gang, their blood was repeatedly examined. Anopheles mosquitos (fuliginosus, culicifacies and pulcher rima) both wild and newly hatched, were placed in bottles with the object of feeding them with crescent blood, and the directions given by James in his book *Malaria* were followed. Owing however to other duties one could not watch the results as systematically as one liked. Fifteen culicifacies were dissected and one zygote found. Twenty-three fuliginosus were dissected and three zygote found. One zygote was found just getting free from the stomach, showing segmentation. No sporozoites were found. My mosquitoes did not live long enough.

It will be seen from the preceding remarks that prophylactic quinine given in 15 grain doses every sixth day is not sufficient to keep off malaria in the jail. At the same time it affords undoubted protection. The policemen had a very bad time with malaria this last season, for it is impossible to make them take quinine. Another point that came out is, quite frequently a man may have rings or crescents in his blood, and yet complains of no fever, and has no fever, he may be even performing his task regularly.

One of that crescent gang still has crescents, and his general appearance is poor.

Prophylactic quinine was issued in the jail from July 24th and ended on November 5th. Almost immediately after the withdrawal of quinine there was a small rush of malarial cases—thirteen with parasites from December 2nd to December 18th. Quinine was again given prophylactically from December 20th for a few weeks with good results.

A sharp look out has been kept for trypanosomes, and many patients have had films taken both during the day and during the night.

Three cases of malarial cachexia have been examined for the new parasite with a negative result.

A Mirror of Hospital Practice.

THE TREATMENT OF INJURIES OF THE ELBOW-JOINT

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FRACTURES and dislocations of the elbow-joint are of frequent occurrence in Bengal, and probably in other parts of India. Forty cases have been treated in the Comilla Dispensary up to the end of October during the present year, including five children at the time of writing this article.

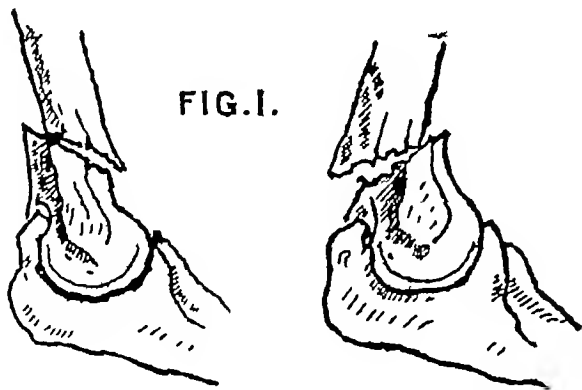
The difficulty experienced in obtaining satisfactory results in the treatment of these injuries

is a matter of common knowledge. The percentage of good results, even in the case of intelligent patients, who conscientiously carry out the instructions given to them, and who present themselves for frequent examination, is small in all parts of the world, while in the case of ignorant and careless patients who cannot be impressed with the gravity of the lesion, and who attend for treatment for a fortnight or so, and after that are not seen again, the number of permanently stiff and almost useless elbows is very large.

The anatomical peculiarities of the joint, and the numerous varieties of injury it may sustain, the tendency to displacement of the fragments, the marked liability to the formation of exuberant callus with serious limitation of movement, the obstinate inflammatory reaction that predisposes to firm adhesions and ankylosis, and, lastly, the possible inclusion of the ulnar, posterior interosseous, or even median nerves in the newly formed bone, all these considerations must always be a source of anxiety to the Surgeon, apart from the less common but possible complication of gangrene from injury to the blood-vessels at the time of the accident.

There are in fact at least eleven forms of fracture affecting the joint directly or indirectly. Briefly they are as follows—

(1) *The supracondylar extra-articular fracture* of the humerus, with forward or backward displacement of the forearm (Kocher's "flexion" and "extension" fracture— Fig 1). This



troublesome injury is usually put up in lateral or anterior angular splints, but the unsatisfactory results have induced some Continental Surgeons to treat the lesion with weight-extension of the forearm, keeping the patient in bed till union has occurred.

(2) *Separation of the humeral epiphysis* up to the 17th year. The fracture is of course intra-articular, and is in many cases difficult to diagnose with certainty, owing to the imperfect crepitus obtained on movement. If complete separation has not occurred the diagnosis is still more difficult, though the ultimate results may be just as serious. A similar fracture also occurs in adults, though it is uncommon, the line of separation taking the same direction as the epiphyseal line. In a severe case of compound

fracture of the elbow in a British soldier, for which I was obliged to amputate, the macerated bones showed a partial cleavage along the epiphyseal line in addition to other extensive injuries to the bones.

(3) *External oblique fracture* through the outer condyle, with separation of the capitellum or fissuring of that process. This injury can hardly escape healing, under the most favourable conditions, in the position of cubitus valgus. The outward inclination of the forearm does not, however, affect the æsthetic result, provided useful movement is obtained.

(4) *Separation of the capitellum* of the humerus, partly or as a whole, resulting in some cases in the presence of a fragment as a free foreign body in the joint, or with fixation in a new position. The condition may easily be mistaken at first for fracture of the head of the radius. In some cases nothing short of operative removal of the fragment can produce a good result.

(5) *Internal oblique fracture* through the inner condyle into the joint, with more or less separation of the trochlea, and occasionally with backward dislocation of the forearm. This injury generally heals in the position of cubitus varus.

(6) *Fracture of the external epicondyle* may rarely occur as a complication of inward dislocation of the forearm. Its chief importance lies in the accompanying intra-articular inflammatory reaction, as in other fractures near the joint.

(7) *Fracture of the internal epicondyle*, usually occurs in association with outward dislocation, and is less rare than the corresponding injury to the outer epicondyle. The tendency to downward displacement of the torn fragment is the chief difficulty in the treatment.

(8) *Vertical fracture of the lower end of the humerus*, with or without radiating fissures to form a T or Y fracture, is the result of severe violence, and is often combined with injury to the upper extremities of the radius and ulna. In such cases anything like a good after-result can hardly be expected.

(9) *Fracture of the olecranon* often associated with fissuring of the upper end of the ulna, rarely ends in good union, unless the fragment is cut down upon and sutured in position. This accident, however, does not concern us at present, as it cannot be treated in the position of acute flexion.

(10) *Fracture of the coronoid process* is a much disputed injury, but undoubtedly occurs in some cases of backward dislocation of the forearm. The attachment of the Brachialis anticus close to the base of the process may, in rare cases, cause a difficulty in reducing the parts to correct apposition.

(11) *Fracture of the head or neck of the radius* may occur, but it is liable to be overlooked, especially when separation is not complete.

It is not necessary to mention the various combinations of all these fractures

The important question of treatment of these numerous injuries now remains to be considered. Until recently, fractures in the neighbourhood of the elbow-joint were almost universally treated by the application of a lateral or anterior angular splint, the elbow being fixed at a right angle. Early passive movements, varying according to different authorities from the end of the first to the end of the third week, are usually insisted upon. The use of angular splints is still, I believe, the most favourite routine (except for fracture of the olecranon) in Europe generally and in India.

It is certainly the usual method in most Indian dispensaries, where—the splints having been applied by the local native doctor—the patient goes home, returns perhaps two or three times to have his bandages changed, and then disappears from the scene, splints and all, with an arm that is probably of very little use to him henceforth. Should the joint become permanently stiff, if the arm is flexed at right angles with moderate supination, the limb will retain a certain amount of usefulness. But if the elbow is ankylosed at right angles in full supination, or—worse still—in pronation, the result is deplorable.

A very good instance of the resulting deformity after the usual treatment of fractured elbow is described by Major Mon,¹ I.M.S., in a European, whose right forearm had been dislocated backwards with fracture of the internal condyle. In spite of skilled care it was found necessary to excise the joint finally before movement could be restored.

Helferich of Griefswald, advises extension of the forearm by weight and pulley for supra-trochlear fractures, and I believe MacCormac used to treat some of his cases on similar lines, but apart from these exceptions the usual treatment is as described above. Within the last ten years, however, a new method has been slowly gaining ground in England and America.² This is the adjustment of dislocations and fractures of the elbow (except those involving the olecranon) in the position of *acute flexion*. The credit of originating the method lies with Robert Jones of Liverpool, though I have no doubt that it will soon appear under some German name, when its popularity will be assured.

Jones published his first account in 1895,³ though he read a paper upon the subject at the British Medical Association's Annual Meeting at Bristol in 1894. According to his advice, in all cases of fracture or dislocation of the elbow (except olecranon fractures) the first thing to be done is to reduce the displacement by full extension, followed by supination and acute flexion of the forearm. The hand is then fixed by means of a Thomas' halter with the ball of the thumb against the side of the neck opposite to the injured arm. Thomas' halter consists

merely of a bandage to pass round the neck, running through a loop of leather, which is stitched in such a manner as to form a second loop in which the patient's wrist is suspended (Fig. 2). The bandage round the neck is

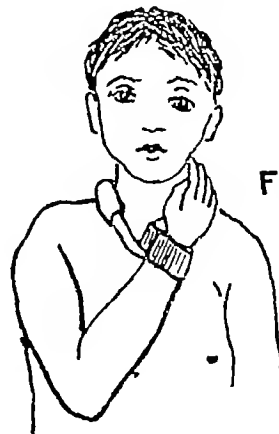


FIG. 2.

made more comfortable by being passed through another strip of leather sewn loosely round it, so as to be capable of being adjusted in the most comfortable position round the neck. In this acute flexion the arm is left continuously until all inflammation has subsided and consolidation is well advanced. No splints or bandages are to be applied to the limb, and *no passive movements* are to be carried out, otherwise excessive callus and plastic effusion will be thrown out. Instead of executing passive movements, the Surgeon slackens the sling when consolidation has occurred (that is about the end of the 3rd or 4th week), and the wrist is allowed to drop two or three inches from the neck. Three or four days later the patient is asked to raise the hand up to its former position, and, if he fails, the sling must be tightened up to its first length. If, however, the patient succeeds in raising his hand as directed, the sling is lowered another two or three inches, and after waiting for three days more the manoeuvre is repeated—the Surgeon thus feeling his way gradually till the halter can be dispensed with altogether—usually after five or six weeks from the date of the injury in a case of fracture, or three to four weeks in the case of a dislocation. Even sprains of the joint are best put up in a position of acute flexion.

This method of treatment is recommended in all cases (except olecranon fractures) whether a correct diagnosis of the exact amount of injury has been made or not. As its originator remarks—"It is only gentlemen of very limited experience who never fail to correctly diagnose an elbow lesion," and X-ray apparatus is not yet within the reach of many Surgeons in India.

The treatment of elbow-injuries in acute flexion was suggested to Jones by observation of the excellent results obtained in treating tubercle of the joint in this position by Thomas, with whom he was long associated in practice. The first⁴ paper read upon the subject dealt with an experience of 243 cases in the years 1892 to 1894.

Shortly after reading an account of the method in 1895 I had an opportunity of testing it upon an old man of 61 in England, who had fallen from a ladder and fractured the lower end of the humerus, with backward displacement of the forearm. Recovery was very satisfactory, and at the end of three months, when last seen by me, the patient had very little impairments of movements.

My last case occurred in a Manipuri boy of 10 who, while playing football on the 14th August, sustained a supra-condylar "extension" fracture, with marked backward displacement of the lower fragment and forearm. The fracture was reduced three hours after the accident, and the elbow put up in acute flexion by means of a bandage passed round the neck and the wrist in a figure-of-3, there being no Thomas' halter at hand. Lint soaked in evaporating lotion was loosely laid over the joint to reduce the inflammation for the first two days, and the pain and swelling rapidly subsided. For three weeks (up to September 4th) the wrist remained in the improvised sling, and the little patient made no objection on the score of discomfort throughout that period. On the 4th September the bandage was slightly loosened to allow the wrist to drop down from the side of the neck for 2 inches. The subsequent progress of the case is described in the following extracts from the notes—

"September 7th—Bandage loosened from neck to allow the wrist to lie 5 inches from its original position against the neck. The patient can put his hand up into the former position without difficulty by allowing the fingers as it were to crawl up the chest. No apparent deformity and no sign of exuberant callus present. The patient says, he has been absolutely free from pain since the third day after the accident.

September 10th—Patient can raise his hand up to the neck without difficulty. Bandage lengthened to allow wrist to hang 7 inches lower than its first position in acute flexion.

September 13th, 16th, 19th—Above manœuvres repeated, till forearm lies suspended at an angle of 120°.

September 22nd—Sling removed. Arm cannot be extended beyond an angle of 135°. Certain exercises prescribed, with massage.

September 25th (beginning of 6th week)—Limit of extension is now 150°, and the arm can be bent quite easily till the fingers touch the middle of the clavicle on the affected side. Forced attempts at increasing flexion, and extension beyond these limits are resisted owing to the pain induced.

September 28th—Movements are still improving.

October 1st—The fingers can be made to touch the shoulder on the affected side by the patient himself, with the help of his other hand. Extension now measures an angle of 165°, mea-

sured as before from an outline tracing of the arm.

October 3rd—The range of movement is now almost normal, the fingers touching the shoulder without pain, and the arm being capable of extension to an angle of 175°. Within the course of the next few days the arm will probably have attained a further degree of movement. There is no exuberant callus or other deformity visible in the joint.

October 12th—Flexion and extension have practically reached the full normal limits. The above example illustrates the course of an ordinary case treated by means of the halter in acute flexion. There has never been any necessity to cause pain by the carrying out of passive movements. After the fifth week, gentle exercise of the arm, with friction and massage, has overcome the stiffness that to a slight extent is necessarily the result of prolonged rest of the joint. If the history of this case be compared with the average progress of a case treated by the older methods, I do not think there can be any doubt of the advantages of the acute flexion recommended by Jones, and if Surgeons who have not yet tried the method will put it to the test, I am sure they will not regret doing so, and then patients will be proportionately grateful at escaping the tortures of passive movements. But I would caution those who adopt this method against trusting their assistants to carry out the details. Unless the Surgeon himself watches the case from beginning to end, he cannot expect to get the best possible results—at all events until he has trained his assistant to follow the line of treatment conscientiously and intelligently throughout the eight or nine weeks during which the patient is under observation.

A CASE OF INTESTINAL OBSTRUCTION STRANGULATION BY THE FETAL REMAINS OF THE OMPHALO-MESEN- TERIC DUCT (MECKEL'S DIVERTICU- LUM) OPERATION—RECOVERY

By H. AUSTEN SMITH, M.B., B.C. (Cantab.), M.R.C.S.,

MAJOR, I.M.S.,

Civil Surgeon, Rae Bareilly

Case—D. W., a boy, aged 4 years and 11 months, was admitted to the European Cottage Hospital at Mussoorie, on October 20th, 1904, suffering from intestinal obstruction.

REFERENCES

- ¹ *Indian Medical Gazette*, October 1903.
- ² H. L. Smith quoted by Pitcher, *Internal Text book of Surgery*, 1902.
- ³ Bloodgood in Helferich's *Fractures and Dislocations*, American edition, 1902. F. J. Cotton. *Annals of Surgery* February and March, 1902.
- ⁴ *Provincial Medical Journal*, January 1st 1895.
- ⁵ The Treatment of Injuries about the Elbow by R. Jones. Read at the B.M.A. Annual Meeting, Bristol, 1894.

History—The child was described as being in indifferent health in Calcutta for a fortnight before he came to Mussoorie, but during the fortnight he was in Mussoorie, before his illness, his uncle stated that he was in excellent health, eating well, and the bowels acting regularly. On October 19th, at 5 P.M., the boy complained of pain in the abdomen, he was put to bed, and a dose of ginger given to him. All night he complained of pain in the abdomen, was restless and sleepless, and vomited frequently, the vomited matter being yellow in colour. His friends noticed that the abdomen was distended, and that touching it caused pain, and the child would tolerate no blankets or other coverings over him. It was stated that brandy to the amount of about four ounces in all was administered to him during the night. On the morning of October 20th he seemed better and had less pain. A dose of castor-oil was given him at 6 A.M. and an enema at 6-45 A.M., when a small constipated motion was passed. At 8 A.M. another dose of castor-oil, said to be about two drachms, was given with some more ginger. At 8-15 another enema was administered and a small pale liquid motion passed after it. He remained fairly quiet until 2 P.M., when, as the pain became more severe, and he became very restless again, the Assistant Civil Surgeon, Mr. Garrud, was sent for, and saw the case first at 3 P.M. Considering this was a case of intestinal obstruction, the above describes the fairly active treatment administered to the child by his friends with whom he was staying. Mr. Garrud suspected obstruction, and asked the friends to call in Major Melville, I.M.S., the Civil Surgeon of Mussoorie, which they did.

Condition on Examination—Major Melville saw the case at 6 P.M. and found the following symptoms—

Abdomen distended, distention most marked at the upper part, tenderness on pressure all over the abdomen, maximum point of tenderness referred to the umbilicus, *i.e.*, about the region of the solar plexus. Respiration rapid and thoracic, pulse 130, small and thready, extremities cold, tongue moist and coated with thin fur. No flatus had been passed for many hours, but urine had been passed in the bed many times. The face showed slight sinking of the eyes, but was not otherwise indicative of serious illness. There was much restlessness, and the child seemed heavy and apathetic, possibly the result of the large amount of alcohol that had been administered. The child was ordered to be sent to the European Cottage Hospital at once, and Major Melville called me in consultation over the case. Everything was ordered to be prepared for immediate operation.

An hour or two afterwards we saw the child together, and found the condition of the child very much the same as that described above, except that it was more serious. The pulse was still about 130 and very weak, the collapse was

more marked, the extremities being quite cold and the body fairly so, the abdomen was very rigid, not markedly distended, but very tender on pressure. On percussion there appeared to be slight dulness in the right iliac fossa, but no tumour of any kind could be felt. Every now and then, with some regularity, there was exacerbation of the abdominal pain, evidently peristalsis, but on carefully viewing the abdomen no movement of the intestines could be detected. The face was still but slightly altered, no motion or flatus had been passed since admission, and there had been no vomiting, the tongue was moist and slightly furred only.

Reviewing the condition of the child it was fairly evident from the sudden onset that he was suffering from intestinal obstruction of an acute nature, the pulse and the rapid collapse indicating the need for immediate exploration. There being no signs of any hernia, the age of the child would suggest intussusception as a cause, but there was no evidence of this. The very acute nature of the illness, the early onset of vomiting and the rapid collapse pointed to obstruction due to acute strangulation, probably by a band, and again taking the age into account it seemed most probable that, if our suspicion was correct, the band would be a Meckel's diverticulum, a form of acute intestinal obstruction which is usually met with in young subjects.

Operation—At 9-30 P.M., the child was placed on the table in a warm room, wrapped round with blankets and hot bottles, and without delay Major Melville commenced the operation, at which I assisted him. Chloroform was the anæsthetic given, but on account of the weakness of the pulse and the collapsed condition, a hypodermic injection of three minims of Liq. Styrchninæ was given at once. The abdominal wall being thoroughly cleansed, hot sterilized towels were placed round the abdomen, exposing only the part necessary for the operation. A free median incision was made, commencing above and extending below the umbilicus, so as to give plenty of room for exploration. On opening the peritoneum at once a slightly foul sanguineous fluid welled up from the abdominal cavity, a grave symptom, and small intestine, normal in aspect, but very distended with gas and fluid presented itself, so great was the tension inside the abdominal cavity that the small intestine, which escaped from the wound during the search for the point of strangulation, could not be replaced. On searching inside the abdominal cavity with the hand no internal hernia could be felt, the appendix seemed normal, and on passing over lengths of the small intestine no point of strangulation or congested gut could be seen. Kummell's plan of allowing the small intestines to prolapse under hot aseptic towels was therefore adopted, and when a good deal of the small intestine had prolapsed a deeply congested portion presented itself, and

this appeared to be firmly bound down. On tracing this out it was seen that a loop of gut, about 12 inches in length, was completely strangulated by a band passing across both ends of the strangulated portion, this band was found to pass from the lower end of the ileum, and its free end was firmly attached to the mesentery proper at its root, under this arch the intestine had slipped and become strangulated. This band was undoubtedly the remains of that foetal structure, the omphalo-mesenteric duct (Meckel's diverticulum). It was at once divided close to its attachment to the ileum, the portion attached to the gut being invaginated and closed by Lembert's sutures, the other end being ligatured. On following up the diverticulum it was found to end in a dilated cystic portion, very dark in colour and extremely congested, and from a careful examination it appeared that the cystic end had become twisted on itself and strangulated, this end attached to the mesentery was ligatured and divided, the cystic portion containing thick, dark, venous blood. In our opinion the gut was just in a recoverable condition, although deeply congested, and so it was decided to leave it. The next difficulty was the considerable distension of the intestines, which made it quite impossible to replace them inside the abdominal cavity, they were therefore kept carefully covered with relays of hot aseptic towels, and the most distended loop having been drawn out over a basin, it was incised parallel to its long axis at a point most distant from the mesentery, and the gas and fluid faecal matter allowed to escape. By gently elevating and moulding the gut above and below the incision a large amount of fluid faecal matter was thus poured out. After this was done the incision in the gut was closed by Lembert's sutures, intestinal silk being used, the edges being inverted and a double row of sutures applied. The condition of the child was very grave at this period, so the operation was completed as quickly as possible. The intestines were carefully replaced in the abdominal cavity, which was an easier matter now that the distension had been to some extent relieved, and the peritoneal cavity was flushed out thoroughly with pints of sterilized hot salt solution, the irrigating tube being passed among the intestines to the back of the abdominal cavity, and into the pelvis. The external wound was sutured with silk worm gut and dressed. It was a question whether or not we should insert a Keith's tube for drainage, but we decided that, as far as we could see, the peritoneal sac had not been contaminated, and drainage was not necessary. As the condition of the child was extremely grave, another hypodermic injection of three minims of Liq. Strichninae was given, and salt solution (3i to Oi of sterile water) was subcutaneously infused into the loose connective tissue to the outer side of the breast. He was also given two enemata of salt solution, of one pint each, at intervals after being placed back

into bed. His condition remained very grave for several hours after the operation, the pulse being hardly perceptible, the extremities cold, and the child very collapsed.

The following is the subsequent report —

October 21st—Nothing given by the mouth except a teaspoonful of hot water occasionally, was sick three times during the day, the vomited matter being dark coloured and foul smelling, the urine was passed in the bed, very restless and semi-delirious, enemata of salt solution continued. Pulse 140 Temperature 99.6

October 22nd—Very restless during the night. Pulse 142 Temperature 99.2 Vomited very frequently a foul smelling dark green matter, only teaspoonfuls of hot water allowed by the mouth. Easier during the morning, and slept for short periods now and then. Enema of soap and water with salts and oil given, and a fair dark coloured motion passed. At 1-30 P.M., for the first time, some flatus was passed, after this the patient seemed easier, sickness less, slept on and off for short periods, wound dressed as it got wet with urine while the patient was asleep. Bowels opened and flatus passed twice during the evening. Nutrient enemata of peptonised milk and the yolk of one egg were commenced and given every four hours.

October 23rd—Patient passed fair night, slept about 5½ hours, sickness entirely stopped, but complained of excessive thirst, bowels opened once during the night and flatus passed. Pulse 134 Temperature 98.4

Slept well during the day, nutrient enemata continued, bowels opened once, motion more formed and light in colour, flatus passed. Only water and lemonade in small quantities given by the mouth and 3iiss brandy during the day. Wound dressed, some redness noticed round some stitches. Pulse 100 Temperature 98.8

October 24th—Passed a quiet night, had about 7½ hours sleep, complained once or twice of pain at the site of the wound.

Still only given hot water, lemonade, and brandy 3i by the mouth, nutrient enemata continued every four hours. Soap and water enema given with good result, formed motion passed.

Slept a good deal during the day, but complained of pain in the region of the wound when awake. Wound dressed, one, or two stitch abscesses forming.

October 25th—Rather more restless, did not have a good night, hot water by mouth and nutrient enemata continued during night. Temperature 100 Pulse 103 Feeding commenced by mouth this morning—peptonised milk 3i and water 3i every hour. Passed one loose motion without enema. Wound dressed. Brandy 3i during the day.

October 26th—Passed fair night, slept six hours in snatches, complained of pain frequently in position of wound, peptonised milk and water gradually increased by the mouth, nutrient

enemata continued Wound dressed and some stitches removed Temperature 99.8 Pulse 104

October 27th—Slept well, nutrient enemata stopped, diet increased—peptonised milk, egg-flip, chicken-soup and one slice of bread allowed Wound dressed, more stitches removed Small amount of discharge from small stitch abscess Temperature 99.8 Pulse 104

October 28th—Passed good night, diet increased—cocoa, milk, chicken-soup, lightly boiled egg and bread and butter allowed Soap and water enema given with good result. Pulse 108 Temperature 98.4

October 29th—Fair night, diet slightly increased during the day Pulse 104 Temperature 97 Wound dressed, looking well

October 30th—Had good night, enema given during night with no result Took fair amount of food during day, constipated action of bowels after enema Pulse 100 Temperature 98.4

October 31st—Patient on full diet, including meat Two stitches, partly embedded, removed

After this the wound was dressed daily and rapidly healed Patient sat up for the first time on November 7th, when the wound was entirely healed, and left the hospital quite well on November 9th

Remarks—The gratifying result in this case was very satisfactory, considering the rapid heart failure and collapse, and the fact that it seemed hardly possible that the child would survive the operation Twenty-nine hours after the first symptom, the child was on the operating table, so that very little time was wasted The early onset of vomiting, which, by the way, was never of a stercoraceous nature before the operation, is interesting as pointing to early and acute strangulation The stercoraceous vomiting commenced after the operation, for presumably the lumen of the strangulated portion of the intestine was not patent for some 36 to 40 hours after the operation—the time of the first passage of flatus

In this case it is evident that the arch formed by the remnant of the omphalo-mesenteric duct was of old date, the free end becoming adherent to the root of the mesentery at some former period, thus leaving the arch ready for a small loop of intestine to slip under at any minute

When we saw the child together shortly before the operation, the diagnosis in the case was not at all certain, it appeared to us from the symptoms, non-passage of flatus, abdominal distention, pain in the region of the umbilicus, early vomiting, quick and thready pulse rapid collapse, that immediate exploration was indicated, although our minds were to some extent open as to what we should find Nevertheless, as there were no signs of intussusception, herniæ, &c, it seemed most probable that it was a case of strangulation of the intestine by a band, and that probably a Meckel's diverticulum The face and tongue were very little altered, probably because the time between the first onset and the operation was so short

In conclusion I must thank Major Melville, I.M.S., Civil Surgeon, of Mussoorie, for permission to publish this instructive and interesting case

A CASE OF SNAKEBITE (COBRA) RECOVERY

By BINODE BIHARI GHOSAL

Assistant Surgeon, Jangipuri

ABOUT 6 A.M., on the 24th May 1903, a chowkidar came and informed me that a Hindu female, named Shiba Durga Das, aged about 40 years and living at Jangipuri, had been bitten by a cobra on the previous night about 10 P.M., and that "Fowl" treatment was being carried on As I had two tubes of Calmette's antivenom (20 c.c.) with me and as I felt some curiosity on hearing of the "Fowl" treatment, (which, report says, effects wonderful cures), I went to the other side of the river Bhagnathi, taking with me a scalpel, cupping case, Liq. Strychnin, two hypodermic syringes (one ordinary and one antitoxin syringe) and a little potash permanganate, scarcely hoping to see the patient alive On the way, I heard from a friend that while she had been fastening the door from inside before retiring for the night, she was bitten on the dorsum of her left foot by a kharish (cobra) Three ligatures were applied but about ten minutes after she had been bitten As it was a fasting day and she was a Hindu widow, she objected to the "Fowl" treatment and it was not begun till 2 A.M. next morning On my arrival there, about 6-45 A.M., I found the patient supported between two females in a sitting posture in the arena of the compound and the house overcrowded with sight-seers I found that she had been bitten about 1" above the meta-tarso-phalangeal joints of the 2nd and 3rd toes on the dorsum of her left foot, but the bitten place had been freely incised There were three strong ligatures applied with ropes—one above the ankle, one below the kneejoint and one above the latter I found nineteen dead chickens heaped on the ground and one was applied in the following way in my presence The feathers having been peeled off from around the anus of a live chicken, it was made to sit on the wound, i.e., the anus applied to the wound while a man was holding it in his hand over the wound After 5 or 6 respiratory efforts, it first began to doze, pupils upturned and then the head gradually fell down upon the chest It seemed to shake off its drowsiness quickly twice or thrice and inspired again and so imbibed fresh poison [! Ed.] Then the intervals between inspiratory efforts became longer till at last its head fell on its breast, beak remained permanently open and so expired It took about 5 minutes to die But notwithstanding the deaths of these twenty chickens, the patient's condition was getting worse and worse, i.e., I

found her pulseless (a thready flickering pulse on her arm over the brachial artery) no radial pulse, respiration very slow—about 6 per minute. Face of an aspen hue. Lips same. Though still conscious, her head almost touched her chest and on repeatedly asking, she whispered in a nasal twang that she could not raise her head. Eyes semi-closed, eyeballs upturned. Tongue flabby and of a pale colour. Consequently I told the man applying the chicken to let me try, and injected hypodermically first ten minims of Liq Strychnin on her left arm. After a minute or two, I found a small, thready flickering pulse at the wrist and she could raise up her head a little, other conditions remained much the same. She was very drowsy still. Next, I enlarged the incision over the bite crucially and began to cup large quantities of dark blood. I continued cupping for nearly half an hour. I did not dare open her ligatures, about that time I felt for her pulse again but could not find, and the improvement which had occurred on strychnin injection passed away. She could not raise her head again and could not whisper articulately, *i.e.*, I could not understand what she whispered on applying my ears close to her mouth and the nasal twang was more marked. Respiration at this time was about three per minute. So seeing her imminent death and also my predicament in taking her case in hand, I injected 10 c. c. of antivenine in her left buttock with as much antiseptic precautions as possible under the circumstances. Her condition rapidly improved. The aspen hues of her face and lips became less marked, the tongue found to be tinged with blood, she could raise up her head, nasal twang decidedly less and she could open her eyes somewhat. Pulse easily perceptible at the wrist. Respiration about ten per minute. So I repeated another injection of 10 c. c. of antivenine about half an hour after the first injection in the same buttock. Her face and lips had the normal hue within 5 minutes. Pulse became stronger at the wrist. Respiration about 15 per minute. No drowsiness. She raised her head herself and said in a natural voice that she felt much better. So an experiment was made with two chickens successively by placing their arm, one after the other on the wound, though kept there for nearly 15 minutes, the moment they were let loose, they flew away to a distance. So I removed the ligatures, washed the wound with strong permanganate of potash solution put a few crystals inside the lips of the wound and dressed the wound antiseptically. I fed her with half a seer of milk soon after and came back satisfied with the result about 11 A.M. She made a rapid recovery from her wound. Though this is the first time I saw the "Fowl" treatment I have heard from other people, private practitioners included, that in the interior, several cases recover with the "Fowl" treatment when rapidly begun and the bite immediately liga-

tured. A practitioner living at Jangipuri and practising there told me that he cured a case of snake bite with the "Fowl" treatment only a few days previous to the present case. As I never used antivenine before and as the patient's condition was critical I did not inject antivenine at first but injected Liq Strychnin instead as I successfully treated another case of snake bite at Madanpur, District Fardpur, with the latter medicine in 1899. In that case, I injected, 40 minims of Liq Strychnin in three doses within an hour, but the patient (a young man aged about 20 years, the brother of the senior Sub-Inspector of Police, Madanpur thana) never had any symptoms of strychnin poisoning but rapidly improved. In the present case though I injected 10 minims of Liq Strychnin, she improved only temporarily and became worse again within half an hour. When I injected antivenine she was almost dying. The moribund condition in which I found her on my arrival there also conclusively proves that no improvement followed the "Fowl" treatment though it had been carried on for nearly 5 hours. Of course a certain amount of poison had been removed from the system as evidenced by the death of twenty chickens [Ed] That the "antivenine" treatment effected her cure there is little doubt, for, though she was in a dying state, the moment antivenine was injected her condition began to improve and within an hour became normal.

A CASE OF TETANUS, TREATED BY SERUM ANTITETANNIQUE

By C F FEARNSIDE,

MAJOR, I.M.S.,

Supdt., Central Jail, Vellore,

and

HOSPITAL ASST ABDUL HAKIM.

THE patient had a history of a fall, when there was a slight abrasion on the foot a week previous to the attack. About a week after this incident the patient complained of stiffness of the neck and difficulty in moving the jaw and twitching of the limbs. On the 7th of October the arms were straight and could not be bent and were tightly drawn to the side, the muscles of the back and the abdomen were tense, and the patient when lifted up was as stiff as a board.

Profuse perspiration was of frequent occurrence, and there were sudamina on the brow. Rissus sardonius was present, and the head could not be turned. The temperature was 100° F. Chloral and bromides were prescribed and serum antitoxin telegraphed for.

8th October.—Patient is in the same state, and the bromide treatment was continued. Great difficulty experienced in swallowing liquids.

Sunday, 9th October.—As the serum had arrived, small doses of it were injected every four

hours during the day and the night. The profuse sweating continues, and the patient's muscles are in the same spasmodic condition. Temperature 101.6° F. Still unable to open the mouth, the angles being retracted.

Monday, 10th October—The belly is somewhat puffed out and tense, and a soap-and-water enema was prescribed, with the result that the bowels moved freely and a dead worm was found in the motion. The serum treatment was continued, and santonine and calomel was prescribed internally.

Tuesday, 11th October—The bowels moved freely and the motion contained two worms. Still no improvement in the tetanic symptoms, the back being as stiff as ever, and the Risus Sardonicus continues. Injections continued.

Wednesday, 12th October—The patient was able to swallow congee and milk, and the mouth can be opened very slightly. The abdominal muscles are less tense, and the fingers are not so stiff. The morning temperature is 100° F and evening temperature 102° F. Bowels moved once and the motions were blood-stained and contained mucus. Injections continued.

Thursday, 13th October—The tongue can now be protruded and the mouth partially opened. The fingers of both hands can be moved. A pint of milk was swallowed in the morning and the evening with less difficulty. Fever was still present. Treatment continued.

Friday, 14th October—The stiffness of the back is wearing off, and the head can be moved slightly, the arms can be bent at the elbow, and the extension of the feet is less marked. The temperature normal. Injections continued.

Saturday, 15th October—The symptoms are abating, and the feet can be moved and the hands raised to the shoulder. The legs can be moved apart, and the mouth opens easily, and difficulty of swallowing is gone. Serum treatment is discontinued. Catarrh of the bowel cured.

Sunday, 16th October—Convalescence continued.

Remarks—The patient continues well. During the treatment the patient had several cathartic baths, and all scars and scabs were carefully treated antiseptically to remove the possibility of any continued growth of the tetanus bacillus locally. The patient's recovery is undoubtedly due to the treatment adopted.

Hospital Assistant Abdul Hakim was in immediate charge of the case.

MENINGO MYELOCELE OPERATION RECOVERY

By A. S. WILSON, M.D.,

MISSION HOSPITAL,

Miraj, W. I.

THE patient, female, ten months, well nourished, was brought into hospital on

February 29th, 1904. Examination shows a large pear shaped sub-occipital tumour 5 inches long, 1½ inches in diameter at its neck where most constricted, greatest diameter about three inches. At birth this tumour was the size of a walnut, and has been growing very rapidly in the past two months. Fluctuation present, but no pulsation. By the light test the sac is translucent and shows a dark band along the right side. Skin over sac in healthy condition and unbroken. Diagnosis, Meningo-myelocele. The mother of the child was anxious to have the operation. The surface of tumour, and as much of back of scalp as the friends would allow, was shaved and cleansed in the usual manner and a dressing of bichloride gauze applied. At the time of operation twenty-four hours later, the patient was placed face downwards with head and neck projecting beyond end of table. The forehead was supported by an assistant and neck kept slightly flexed. After another cleansing with formalin solution and solution of bichloride of mercury in alcohol, that sac was opened by an elliptical incision on each side and about 1½ inches from its neck. Flaps were dissected back to the base, the dural sac opened and about two ounces of clear fluid evacuated. Projecting into the bottom of this sac was another delicate walled sac of arachnoid about the size of a walnut. This was opened and two or three drachms of fluid escaped. The cord was then found bulging into the neck of this second sac and slightly adherent to it. These adhesions were gently broken up with the finger, and the cord pushed back into the canal. The arachnoid sac was closed at its neck, after freeing it from the dura, with a purse string ligature of fine catgut and cut away. Flaps of dura were united over this with the same material, and the skin closed with interrupted celluloid sutures and sealed with iodoformised collodion. Chloroform four drachms. Operation a little over an hour.

AFTER-TREATMENT

The child was kept for several days constantly in the horizontal position. A few hours after the operation it nursed well. There were never any pressure symptoms. The temperature was 98.6 before operation, and 99 three hours after. The second day morning temperature 99.8, evening 101. Third day morning 102. The wound was examined, and as there seemed to be slight distention at upper angle, one suture was removed, when a few drops of cloudy serum escaped. The temperature fell by evening of next day to 99 and did not rise again. During this time the child seemed perfectly well and free from pain. Sutures were all removed on tenth day. Wound healed by first intention. The child was kept under observation six days longer and discharged April 25th (forty days later) her father writes that she is in perfect health.

THE above is a reproduction of a tablet in the hall of the Medical College Hospital, Calcutta. It illustrates the spirit of the schools of medicine, and we are indebted to Major D M MOIR, I MS, for a copy. We

may also add the following oaths of the Universities of Edinburgh, Glasgow and Montpellier, for which we are indebted to an article in a recent number of the *Medical Chronicle* —

University of Edinburgh—The Sponsio Academica for graduates in Medicine of the University of Edinburgh since 1803 is as follows —

Sponsio Academica for Graduates in Medicine
 “Ego Doctoratus in Arte Medica titulo jam donandus, sancte coram Deo cordium scrutatore, spondeo, me in omni grati animi officio erga Universitatem Academicam Edinburgensem ad extremum vitæ habitum perseveraturum

Tum porro Artem Medicam caute, caste, probeque exercitaturum, et quoad potero, omnia ad ægrotorum corporum salutem conducentia cum fide procuraturum Quæ, denique, inter medendum visa vel audita sileri conveniat, non sive gravi causa vulgaturum

Ita præsens spondenti adsit Numen ”

University of Glasgow—“I do solemnly and sincerely declare, that, as a Graduate in Medicine of the University of Glasgow, I will exercise the several parts of my profession, to the best of my knowledge and abilities, for the good, safety, and welfare of all persons committing themselves, or committed to my care and direction, and that I will not knowingly or intentionally do anything or administer anything to them to then hurt or prejudice, for any consideration, or from any motive whatever And I further declare, that I will keep silence as to anything I have seen or heard while visiting the sick which it would be improper to divulge ”

The University of Montpellier—Serment
 “En présence des Maîtres de cette école, de mes chers condisciples et devant l'effigie d'Hippocrate, je promets et je jure, au nom de l'Être suprême, d'être fidèle aux lois de l'honneur et de la probité dans l'exercice de la médecine Je donnerai mes soins gratuits à l'indigent, et n'exigerai jamais un salaire au dessus de mon travail Admis dans l'intérieur des maisons, mes yeux ne verront pas ce qui s'y passe, ma langue tana les secrets qui mes seront confiés, et mon état ne servira pas à corrompre les mœurs ni à favoriser le crime Respectueux et reconnaissant envers mes Maîtres, je rendrai à leur enfants l'instruction que j'ai reçue de leurs pères

“Que les hommes m'accordent leur estime, si je suis fidèle à mes promesses! Que je sois

convert d'opprobre et méprise de mes confrères si j'y manque ”

FOUNDATION OF THE “MEDICAL COLLEGE HOSPITAL,” AT CALCUTTA.

WE are indebted to Lieutenant-Colonel G A Harris, FRCP, IMS, Professor of Materia Medica, Calcutta, for the following interesting account, from the *Illustrated London News* of 20th January 1849

“By the last received Overland Mail, we were favoured by a Correspondent with the accompanying Sketch of a very interesting ceremony in Calcutta, on September 30—the laying of the foundation-stone of a large hospital, which, when completed, will add even to the architectural beauty of the ‘City of Palaces’ The ceremony was performed with Masonic Honours by the Earl of Dalhousie, the Governor-General, and we are happy to be enabled to commemorate the event by a view of the spectacle, accompanied by a portrait of his Lordship

The site of the new building is a large plot of ground due east of the Medical College The visitors began to arrive about an hour before the appointed time 5 o'clock in the evening Among them were Majors-General Sir J H Little and Dudley Hill, Bishop Wilson, the Hon Mr Bethune, the Hon Mr Millett, Mr H M Elliot, Mr Halliday, Mr Bushby, and others A quarter of an hour prior to the arrival of the Governor-General, the Brethren of the Masonic Craft marched in procession from the Medical College into the area where the ceremony was to take place, and drew up in front of the platform which was to form the basis of the corner-stone

His Lordship upon arrival was led by Mr Longueville Clarke as Grand Marshal, and by the Hon Mr Bethune, Mr Elliot, and others, to the throne in the pavilion that had been erected for the occasion, the Band playing the National Air The Brethren of the Mystic Tie also did honour to his Lordship by a salute after their own fashion, by raising both hands high in mid-air, and the bringing them down simultaneously upon the thighs three distinct times

After this, Dr John Grant (as Grand Master of Bengal and its Territories) conducted his Lordship to a seat on the eastern side of the platform which was to receive the table, and stone, and went through the ceremonial of the ‘Masonic Honours’ At his summons one brother

produced a glass bottle containing the current coin of the country, another, a second bottle, containing plan of the hospital and the local publications of the day (the *Hurkaru*, *Star* and *Englishman*, &c), a third (Dr Mount), the silver tablet, and a fourth, the silver trowel. Each article in turn was touched by his Lordship, the inscription upon the tablet being also read, at the request of the Grand Master, who then proceeded to place the two first into recesses formed in the platform for their reception, remarking, in reference to the newspapers, that he would not hazard an opinion as to whether or not they 'would be held in high estimation two or three thousand years hence'.

The tablets were next presented to Majors-General Sir J H Little and Dudley Hill, the Bishop, and the Members of Council present, to be read.

This done, the Grand Master said that nothing remained for him to do but, with the permission of the Governor General, who had been pleased to do honour to the occasion by his presence, to lay the corner-stone of the Fever Hospital. The act, however, must be taken to be essentially that of his Lordship himself, who was to the east of the platform, and he (Dr Grant) must be regarded as only the medium of its performance.

The Grand Master then called for the cement, but, before proceeding to use it, he remembered that the tablet ought to have been read, and demanded to know where Brother Henry Elliot was, that he might be called upon to discharge the office.

Mr H M Elliot responded from the midst of a crowd, saying he was without an apron.

The Grand Master summoned him forward notwithstanding, saying he was a right sterling man and mason, apron or no apron.

Mr Elliot complied, reading the inscription as follows —

INSCRIPTION ON THE PLATE DEPOSITED IN THE FOUNDATION-STONE OF THE MEDICAL COLLEGE HOSPITAL HOSPITAL

In the Reign of Her Most Gracious Majesty
Victoria, the Foundation-Stone of the
MEDICAL COLLEGE HOSPITAL,
was laid with Masonic Honours by the Right
Honourable
JAMES ANDREW, EARL OF DALHOUSIE, K T,

Past Grand Master of Scotland, assisted by
JOHN GRANT, Esq,

Provincial Grand Master of Bengal and its
Territories, supported by a numerous and
respectable Convocation of the Craft, in the
presence of the Hon

J E D BETHUNE, President, and the Members
of the Council of Education, and a large assembly
of the inhabitants of Calcutta

ON SATURDAY, THE THIRTIETH DAY OF
SEPTEMBER, A D
1848 (A L 5848)

This Hospital is founded for the Relief of the
Sick Poor of all Classes and Creeds in the City
of Calcutta, and particularly for those afflicted
with Epidemic Disease

COUNCIL OF EDUCATION
President—Hon J E D
Bethune

Members

J W Colville, Esq
H M Elliot, Esq
C Sendon, Esq
J Grant, Esq
J Forsyth, Esq
Russomoy Dutt, Esq
Pronocoomar Tagore, Esq
Member and Secretary
Fred J Mount, M D

COUNCIL OF MEDICAL
COLLEGE.

H Falconer, Esq, M D, F R S
J Jackson, M B, F R C S
H H Goodeve, Esq, M D,
F R C S
Allan Webb, Esq
H Walker, Esq
R O'Shaughnessy, F R C S
Member and Secretary
Fred J Mount, M D, F R
C S
Messrs Burn & Co, Archi
tects

(ON THE REVERSE OF THE PLATE)

The money for building this hospital was
raised partly by public subscriptions through
the Municipal and Fever Hospital Committee
and the Council of Education which produced
Rupees 1,03,000. A further sum of Company's
107090 was contributed to this purpose of which
50,000 was a munificent donation for the
benefit of the City, by Raja Pentab Chunder
Singh, and the remainder was the balance of a
sum of money raised by Lottery for the improve-
ment of Calcutta. Part of the ground on which
it stands, of the value of Rupees 12,000, was
generously given by Baboo Muty Lal Seal.

The Grand Master now, stopping with cement
the recesses into which the glass bottles had
been put placed the tablet over them, and
covered it with mortar likewise. He then
plunged the trowel, cased in tin into the mortar,
which he spread over the stone in the proper
manner, after which he drew the silver trowel
out of its tin sheath, and presented it to his
Lordship, expressing a hope that it would long
be an heir-loom in his family.

The instrument is set in an ivory handle, having a view of the Fever Hospital, his Lordship's arms, the Collar and Cross of the Order of the Thistle, and several Masonic devices upon it, and, considering the short, very short space of time in which it was got ready, it does the greatest credit to the artistic skill and taste of Messrs Latty Brothers.

The Grand Master then directed the brethren to lower the stone into its place, aiding himself in adjusting it, and turning towards the east, with hands uplifted, exclaimed, 'May the Great Architect of the Universe grant a blessing on this stone which we have now laid, and that we may be enabled, by providence, to finish this and every other virtuous undertaking.' The brethren replied with the Masonic answer, 'So mote it be.'

The Grand Master next poured a cornucopia full of corn, a vase filled with wine, and another containing oil, all of which had been previously touched by Lord Dalhousie, upon the corner-stone, exclaiming, 'May the All-bounteous Author of Nature bless the city with corn, wine, and oil, and with all the necessary conveniences of life.' The brethren replied, as before, 'So mote it be.'

The Grand Master, then addressing himself to the Governor-General and the rest of the company, feelingly expressed the gratification he had experienced in taking part in the ceremony, and characterised 'the design of founding so noble an institution as one of the most eminently palpable and satisfactory proofs that a great, wise, and liberal Government could give of its deep anxiety for the welfare of the people. The building of which the corner-stone had been laid this evening is supplemental to the Medical College, and will prove an asylum that was much needed for the sick, while it will, at the same time, prove instrumental in the advancement of science. In proportion to the amount of civilisation in any country will be found the solicitude for human suffering.' 'Tell me,' said the Grand Master, 'of any country where the sick and the poor are not cared for, and I will at once say, that, whatever its pretensions, it is a country or city in low state of civilisation. (Hear.) It is a subject of honest pride to us, that the founding of such edifices as hospitals and infirmaries, and the establishment of funds for their due maintenance and support, is a feature of Christian civilisation, and Christian civilisation alone.

I hope that the spectators of this scene do not consider it as an idle pageant, but one fraught with a moral meaning.'

'I consider,' added the Grand Master, specially addressing Lord Dalhousie, 'it to be a happy omen for your Lordship, that the very first appearance which you have made in public before the people of Calcutta, has for its object the foundation of an institution which is to prove a temple of piety, of peace, and of mercy, to the hundreds of the sick, the homeless, and the friendless. When the generation that is now standing around me will have long passed away, the significant ceremonial of this day still have a meaning and moral, and be gratefully appreciated in the recollections of the living. It has been a ceremonial of forms, and I am aware that in these forms were many things which appeared without a purpose to the crowd at large assembled here to-day, but let them receive the assurance from me, that every one of these forms which, as a Mason, I adopted to-day, is pregnant with a meaning expressive alike of our hopes for the future and of thanksgiving to God for bounty which He bestows upon us, for the peace which He suffers us to enjoy, and for the illustrious Head and Governor whom He has given us, in whom we place the most implicit trust and confidence.' (Hear, hear.)

The Governor-General now rose and said — 'Right Worshipful Provincial Grand Master, Right Worshipful Senior Grand Wardens and Brethren all, it is a matter of the highest gratification to me that it has been in my power to be present to bear a part in the proceedings of this evening. It is gratifying to me equally in my capacity of a public officer in this country, and of a brother of the Masonic Craft. It is in the highest degree gratifying to me, that, having been, from circumstances connected with public duties, deprived for some years of the opportunities of social intercourse, and the exercise of the functions of a member of the Masonic fraternity I find myself, thousands and thousands of miles away from the point at which I left them, called upon to renew my communication with friends in private life, and aid, as a brother Mason in works of public charity and beneficence. Ages and ages have passed away since you, my brethren, have ceased actively to engage in the practice of your arts, but, though magnificent monuments of your skill cover the face of England and European edifices and buildings more noble, of

superior architectural beauty, and of more extended usefulness than the Calcutta Fever Hospital may be, you will have more reason to pride and congratulate yourselves, regard being had to circumstances, upon the share you have taken this evening in the discharge of your Masonic duties in laying this corner-stone for an hospital for the poor. I venture to express to this assembly the high admiration I felt upon learning, from the records of the Indian Government, of the liberality of this community in contributing so princely a fund to the laudable and admirable purpose of founding a charity Fever Hospital for the poor of this land, and I beg to offer the tribute of my humble, but just and sincere, admiration to the honourable gentlemen who placed so large and munificent a donation at the disposal of the Government, and upon the part of the Government, to tender to him my warmest thanks for the ready and cheerful acquiescence which he gave to its being applied in furtherance of the project of founding a Fever Hospital for Calcutta.

His Lordship then explained that he had proposed that the funds left at the disposal of the Government should at once be added to the contributions realised for the Calcutta Fever Hospital, so that the aggregate might be adequate for the completion of the building. 'Now that the corner-stone has been laid,' said his Lordship, 'I hope that, when I return among you after the temporary separation which the exigencies of the public service require, I shall find that the edifice itself will have far advanced towards completion, holding out an object of emulation to the wealthy inhabitants of Calcutta, as an institution which will help to spread the bed for the poor in sickness, afford a home to the houseless, give skilful friends to the friendless, and extend the hand of succour and protection to the afflicted and forlorn. (Hear, hear.) The implement, Right Worshipful Grand Master, which you have presented to me, I shall retain with great and constant satisfaction; and if it shall please God to preserve my life, it shall serve to recall, years hence, the grateful memory of the imposing and most interesting ceremony of the laying of the corner-stone of a public Fever Hospital for the capital of British India, which I have witnessed this evening' (Loud cheers.)

At the conclusion of his address, his Lordship was conducted by the Grand Master and his Brethren to his carriage, as was the Bishop

and Sir John Little, and the assembly dispersed.

The ceremony must, altogether, have been a splendid spectacle. In the *Indian News*, whence we have condensed our report of the proceedings, it is stated that 'the concourse of people collected on the occasion was immense. The scene that presented itself was altogether highly picturesque and imposing, and must have been particularly so to those who have never before witnessed anything of the kind. The Masonic Brethren, all arranged in their richest costumes, with the setting sun glittering upon their glittering decorations. The thousands of natives grouped around them, and though last not least, the ladies, who, seated in a raised pavilion, graced the ceremony with their presence, all combined to produce an effect which it is easier to imagine than describe.'

LONDON LETTER

THE DOOM OF SPECTACLES

A STARTLING announcement has been made by a London Surgeon that it is possible by manipulating the eye-balls to correct errors of refraction and thus render the use of spectacles unnecessary. It is needless to remark that this would constitute a triumph and a boon. The manner of proclaiming this novel departure in ophthalmic practice savoured so much of advertisement and quackery as to raise some doubts regarding its genuineness. The system, if effective, would ruin a large and prosperous industry. A leading optician of London challenged the inventor to prove his case by trial and offered to pay £100 to a charity if the experiment should turn out successful. A prominent ophthalmic surgeon was selected as referee and proposals were made as regards the selection of suitable subjects and arrangements for properly conducting the test. It was, however, found impossible to come to satisfactory terms with the would-be innovator, and the trial has not taken place. It looks as if the doom of spectacles is indefinitely postponed if not altogether problematical, and the spectacle maker's trade will not suffer any material retrenchment. It is admitted that some degree of improvement in the slighter degrees of refractive aberration may be produced by globe massage, but even this is probably temporary in higher degrees, no useful change for the better, either temporary or permanent, can be produced by attempts to alter the shape of the

refracting media. Efforts more or less successful have been made in high degrees of myopia, to diminish the excessive refraction by surgical operation, but the aid of lenses is still necessary to perfect vision in such cases, and in hypermetropia, presbyopia and astigmatism it is difficult to conceive how the convexity of the media can be artificially increased, otherwise than by means of lenses. The proposal to render the use of spectacles unnecessary by manipulation of the globe, however captivating, has not met with acceptance for the excellent reason that it has not been proved feasible.

ARTIFICIAL RESPIRATION

An important paper on this subject has recently been read by Professor Schaefer before the Royal Society of Edinburgh. The amount of air normally entering the lungs in the supine and prone position in a healthy youth was first determined by careful experiment and then the various methods of artificial respiration were subjected to the same test. The oldest method is Marshall Hall's, in which the patient is placed in the prone position and rhythmically moved to the lateral pressure being exercised on the back when prone. This plan was found to fall far short of the normal exchange of air either in prone or supine attitude. Sylvester's system of expanding the chest by traction upwards of the arms and emptying it by pressure on the sides of the chest walls on lowering the arms gave still less favourable results. Howard's direct method of alternately compressing the lower chest wall by the spread hands and letting go sharply was found to cause a much larger air entry, but still below the normal, but it is conducted in the supine attitude which, in many cases, as in drowning, prevent other useful indications from being fulfilled and is sometimes subject to other objections. Schaefer's proposal is to apply alternate pressure and relaxation to the sides of the ribs with the patient in a prone position and a roll of clothing or a pillow under the epigastrium. This gave an air exchange exceeding the normal. Both these procedures must be effected by the operator kneeling on the same plane as the patient, a knee on each side of the body and the face directed towards the patient's head. The body of the operator rises and falls as pressure is relaxed and applied. This renders the work easier and more effective and must be done rhythmically from 13 to 18 times in the minute.

There are cases in the newly born when alternate inflation and suction by means of a tube or by the mouth is probably the most efficient way of starting the respiratory act and filling the air tubes and reflex aids such as nipping and pulling the tongue, flipping with hand or wet towels, and the use of stimulants must also be thought of, but Professor Schaefer has advanced good reason for the adoption of the system which he advocates, especially in cases of drowning. It needs no instrument or apparatus.

K McL

Dated 17th October, 1904

Current Topics

OUR FORTIETH VOLUME.

THE present number commences the fortieth volume of the *Indian Medical Gazette*, it having been founded in 1865. Though we have now reached an assured position and middle age we may still hope to vigorously flourish. Indeed the large number of contributors and subscribers indicate that the Gazette is more and more being appreciated by medical men in India.

SPECIAL DYSENTERY NUMBER

As already announced we propose to bring out a special dysentery number, probably in June. We have already received several offers of papers, and we will be glad to hear of more. Medical officers who wish to contribute might prefer to discuss only one aspect or so of the subject of dysentery. We would therefore be obliged if our readers who intend to contribute to the special number would bear this in mind, and take up one branch of the subject, *eg*, etiology and prevention, pathology, or treatment. Papers should be in the hands of the Editor early in April.

THE TRANSVAAL BURGHER CAMPS

LIEUTENANT-COLONEL S J THOMSON, C I E, I M S, Sanitary Commissioner, U P, and lately Director of the Burger Camps in the Transvaal, has published a modest little pamphlet in which he describes the work done by these camps, about which such a large amount of misrepresentation has been circulated by more or less interested busy bodies. Mark, therefore, how a plain tale will put them down?

Our readers will remember how that in the end of 1901 the Colonial Secretary asked the Indian Government for the loan of the services of two experienced officers of the Indian Medical Service, for the management and control of

the camps which had been started for the housing of the Boer inhabitants, in places where from military considerations it was necessary to make them evacuate their farms

Lieutenant-Colonel Thomson and Colonel J S Wilkins, DSO, were the two officers chosen, one for the Transvaal, and the other for the Orange River Colony Camps. Lieutenant-Colonel Thomson took with him Captain J C Robertson, RMS, Mr C E W Sands, Indian Police, and Lieutenant R W Henderson, of the Bengal Cavalry

The Director of the Burger Camps controlled all branches of camp administration, and as Colonel Thomson writes —

"The position of Director of Burger Camp was probably unique in the annals of sanitary history. With powers under Martial Law to insist on orders being carried out, with adequate funds an unusual opportunity was offered of determining whether it is possible to maintain a large body of men, women and children in large camps in good health."

The present little book is therefore not only a record of good work done but is a manual of instructions for the control of large camps based upon actual experience

In the Transvaal there were 19 large camps under the control of the Director, they necessarily varied in size and shape, all were provided with tents, hospitals, schools, orphanages, churches, &c. The tent used was the ordinary bell tent, but Colonel Thomson, as all who have experience of Indian tents agree, preferred what we call in India the E P tent. More or less *pucca* floors were put into each tent, and fire places. The difficulties were great, and the ignorance of the inhabitants was equally so, vaccination was dreaded as it was thought to be a means of branding the children with the Government "Broad Arrow," some simple kalesthenic exercises for guls were considered to be a method of teaching "hands up." Stores of food and everything else had to be brought up from the far distant sea-ports, only small quantities of fresh vegetables could be obtained locally. Each camp had a Superintendent, three or more medical officers, matrons, accountants, store-keepers, clerks, &c. A camp usually consisted of about 3,000 souls, never more than 5,000. The dietary was liberal.

At first measles and enteric fever were very prevalent, measles specially was dangerous on account of its sequelæ bronchitis and pneumonia, and the latter two diseases also prevailed in the cold weather. There were no cases of plague and very little small-pox, scurvy was practically non-existent, malarial fever were not common, except in certain camps which received inmates from the low country.

The following table is worth producing as showing the remarkable improvement which

followed on these camps being put under experienced sanitary control —

Month 1902	No of deaths	Death rate per mille per annum	_____
January	639	135	
February	295	70	
March	174	44	
April	106	28	
May	98	26	
June	74	19	
July	76	23*	
August	42	14	
September	45	21	
October	37	25	
November	16	15	
December	13	22	

The rise in July was due to an influx of large numbers of half-starved Boers who had surrendered on the conclusion of peace. The results of the last eight months, 22 per mille death-rate must be considered a remarkable achievement. Nor was the work of these camps confined merely to the preservation of lives, and the maintenance of health and comfort to the inmates. It did more, distrust and dislike soon gave way to confidence and good feeling, and addresses signed by hundreds of men, after peace was declared, testified to their appreciation of the care and kindness which had been shown to their wives and children in the camps. To the agricultural Boer the camps were a liberal education in sanitation, which must have its good effect.

Lieutenant-Colonel Thomson has done sanitation a service in publishing this interesting record of an unique sanitary experiment. It shows what can be done by experienced Sanitarians, when provided with adequate powers and with adequate funds.

ETIOLOGY OF DYSENTERY IN CEYLON

DR A CASTELLANI, the Director of the Bacteriological Institute, Colombo, has published a very interesting paper on Dysentery in Ceylon which is of special interest to medical men in India, as the disease appears to be very similar in India and in Ceylon (*J of Hygiene*, vol 4, No 4, October, 1904).

Dysentery is a very common disease in Ceylon, there were 3,017 cases treated in the Ceylon Hospitals in 1902, with no less than 999 deaths, a very high death-rate, 33 per cent of cases. This is a very high death-rate, but not very different from that of public hospitals and dispensaries in India.*

Dr Castellani's paper is worth giving a brief synopsis of —

He shows that at present there is a tendency to admit two forms of dysentery, an amœbic form

* In Bengal Jails the case mortality from dysentery is only 2 per cent. In Japan Scheube put it at 7 per cent, Ogata at 24 per cent. In Egypt Griesinger calculated it at 36 to 40 per cent. The explanation of the difference is that in prisons the disease is promptly and efficiently treated, in public hospitals patients do not usually come into hospital till the disease is far advanced.—ED, I M G

("incorrectly called also tropical dysentery"), and a bacterial form. The bacterial form may not always be caused by the same organism, "though recent researches tend to show that the largest number of cases are due to the bacillus described by Shiga and Kiuse." Le Dantec also describes a form, which he called *La Dysenterie spirillare*, for according to this writer the "mucus passed is practically a pure culture of spirilla." Celli has described a disease "at any rate very nearly related to dysentery" which is called colitis contagiosa of Escherich, it is common in Italy and caused probably by the bact. coli dysentericum of Celli. Then we have asylum dysentery in England, said by Durham to be due to a minute micrococcus, but on the other hand, Eyre has found in the asylum cases a bacillus, which Todd believes to be identical with Shiga's and Kiuse's bacilli.

Dr Castellani has examined 23 cases and in 19 "the presence of the b. dysenteriae, Shiga-Kiuse, was demonstrated in the intestinal contents or stools. Of the four remaining cases, in one the bacillus was not found, but the blood of the patient agglutinated the bacillus," in a second a bacillus closely resembling Kiuse's was found, and in two a large number of amebæ were found, while b. dysenteriae, Shiga-Kiuse, could not be demonstrated.

The only important difference between the descriptions of the bacilli by Shiga and by Kiuse is that Shiga described it as mobile, and Kiuse as non-mobile. Castellani's cases were "absolutely non-mobile." A great resemblance exists between the dysentery and the typhoid bacilli, practically they cannot be distinguished by their cultural characters, but Kiuse's dysentery bacillus is non-mobile, and the serum of an animal immunised against typhoid has no action on Kiuse's bacillus and *vice versa*.

Agglutination, dilutions 1 in 40, usual technique, the German and Ceylon strains behave practically in the same way. The blood shows presence of specific agglutinins only after the first three to eight days of the disease, and agglutination is generally well marked in convalescents, even up to four months in one case. Agglutination in some cases is not regular, the agglutination does not proceed parallel with the severity of the disease, it may drop very low *sub finem vite*.

Castellani thinks the preparation of an anti-dysenteric vaccine might be worth a trial in localities where severe epidemics are frequent. Our author has but little to say on the prevention of dysentery, but we are glad to notice that his experience is the same as ours in India, *viz*, that a good water will not prevent dysentery. He says, "Though one cannot deny that drinking water may convey the germ, it must be noted that here in Colombo the water is from a bacteriological point of view a very good one. This also holds for the water used in the jails, where cases of dysentery are so common. I think the best way to diminish the number of

cases of dysentery is to improve the sanitation, especially in regard to the removal of excreta, drainage, &c. In Germany it has been observed that outbreaks of dysentery often occur, in places which have a good supply of water, but a bad system of drains. Patients with dysentery should be isolated and their stools disinfected at once. Antidysentery vaccination does not appear to me to be promising."*

Intestinal flora—Several other germs are usually found in association with the b. dysenteriae, b. coli is almost constantly present, and the bacilli and streptococci are also found, but have nothing to do with the disease.

Paradysentery—Castellani describes a bacillus, resembling but different from Kiuse's bacillus, and suggest that there may be a paradysentery, as well as a paratyphoid.

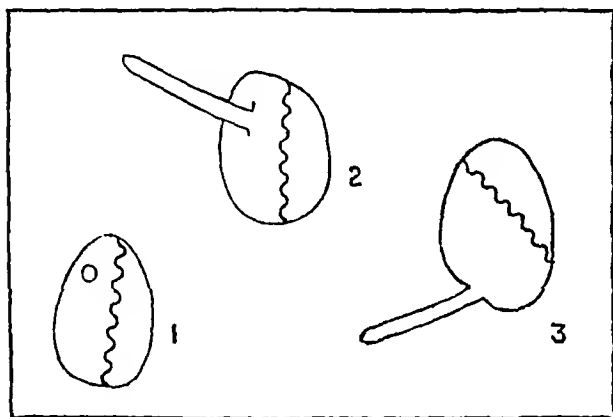
Amœbic dysentery—In two cases there was no reaction either with the dysentery strains, nor with the paradysentery, in both cases many amœbæ were found, and both had also liver-abscess. It may be noted that, as we have often pointed out, liver-abscess was very rare in Ceylon dysentery, just as it is in Indian dysentery in jails.

As regards amœbic dysentery, is there such a disease? Kautsky, Kiuse, Councilman, Manson and Koch say there is, but Grassi and Celli deny it. Those who deny it base their opinion especially on the fact that amœbæ may be found in stools of perfectly normal persons or in persons suffering from other diseases. "This is certainly correct," writes Castellani. Does the so-called amœbic coli represent one or several species? Celli distinguishes several, Kiuse and Pasquale admit two different species. That eminent authority on the protozoa Schaudin has recently concluded that there are two species of amœba coli, morphologically and biologically different, so different that they might even belong to different genera, one species which is harmless, he calls *entamœba coli*, Losch, the other which is pathogenic is called *entamœba histolytica*. In the *E. coli* the nucleus is clearly defined and contains several nucleoli, reproduction takes place by fission and by formation of cysts, each containing eight nuclei, on the other hand, in *E. histolytica* the nucleus is very indistinct and often absolutely invisible, reproduction takes place always by fission, and never by formation of eight-nuclei cysts.

* Regarding dysentery and the water supply we may quote the following from an article on Dysentery in Institutions by the present reviewer (*B. M. J.*, September 20th, 1902): "Water is a medium for the conveyance of three complaints—cholera, typhoid, and dysentery. Few who have practical acquaintance with these diseases can believe that water is at all times and places the only means of conveyance specifically polluted water can certainly account for sudden, widespread and short-lived outbreaks, but will it equally well account for the steady low persistence of cases? I do not say that bad water will not convey dysentery, but what I maintain is that a good water supply will not banish it." It will be seen that the experience in Ceylon jails confirms this opinion, therefore we must look elsewhere for the causation and so prevention of dysentery in these institutions.—ED, *I. M. G.*

This is a point to be followed up if we wish to determine the pathogenicity of the amœbæ found in some cases of dysentery.

Dr Castellani also figures and describes another protozoon apparently new. It is shaped as follows, which he has called *entamoeba undulosa*.



This organism was usually oval, and presented a rapid continuous undulating movement, always in the same direction. Now and then at an interval of 15 to 20 seconds a very narrow long pseudopodium shot out from the body, only one pseudopodium at a time, and from different parts of the body. The organism had a finely granular protoplasm, and flagella were invariably absent.

Castellani concludes his valuable article as follows —

(1) In Ceylon there are several forms of dysentery.

(2) A rare form is due to bacilli very nearly related to the typical Shiga-Kiuse's bacilli (paratyphoid).

(3) A third form of dysentery is represented by amœbic dysentery, and the species of amœba which causes it in Ceylon is probably the amœba histolytica of Schaudin. This form is apparently rare in the island.

We recommend a further study of the amœba of the human intestinal tract to those of our readers who are interested in this subject, in connection with dysentery and with liver-abscess.

MEASLES IN THE TROPICS

THE fact which we noted (*I M G*, November 1904, p 431) that no less than 98,112 fatal cases of measles were reported in the year, 1903, from the United Provinces alone shows that this disease is not only common in India, but is a serious factor in the vital statistics of this country. We have been able to find no other references to any widespread prevalence of this disease in India in that year, but in the report of the Sanitary Commissioner for the United Provinces in 1903 we find it recorded that the Civil Surgeons of no less than 23 districts reported on measles as one of the chief causes in the infantile mortality in that province. There were

also 15,292 cases reported in the United Provinces in the previous year.

It is probable that in India, as in other countries where it is a common disease, measles chiefly affects the young, or at least is chiefly fatal among young children. From table LIII of the report of the Sanitary Commissioner with the Government of India (1902) it appears that this disease was, however, not unknown among European and Indian adults. For in the European army 76 cases in men, 5 in women and 200 in children are recorded, as well as 328 cases in the Native army and 58 in the prisons of India.

It would appear, however, that in the United Provinces in 1903 the disease appeared in true epidemic form, though it is probably that other diseases may have been included in the huge total of nearly a lac of fatal cases. From this number of fatal cases we may well imagine that there may have been well over half a million cases of measles in those provinces in 1903. Measles is one of those diseases which at irregular intervals breaks out in true epidemic if not actually in pandemic form, for we learn from that invaluable work, Clemow's *Geography of Diseases*, that in 1796-1801 there were great epidemics in France, Germany and England. In 1834-36 the disease spread widely over the greater part of Northern and Central Europe, and in 1846-47 over all Europe and to North America. In China measles is a very common disease, and in Japan a recent writer has said that it occurs in widespread epidemics at intervals of about 20 years, but isolated cases are also common at all times. In Australia and New Zealand measles is said to have been first introduced in 1854, and even now chiefly occurs in the form of epidemics, but of recent years it has not to any important extent been prevalent in that continent. The disease is common in many of the islands of the Pacific, it is now endemic in Fiji, but there was a terribly fatal epidemic in Fiji in 1875 causing 20,000 deaths. In Africa generally it is both endemic and epidemic, and in Uganda has been recognised as a fatal disease of native children. It is also to be found all over South Africa, as the experiences of the Burgher Camps show.

We may therefore agree with Clemow, that "all races are susceptible to it, and it has been shown just as capable of attacking the Chinaman, the Hindu and the Negro as the European."

It is well known that measles is one of the most infectious or "contagious" of diseases. It is probably spread by means of fomites or by the movements of infected persons.

In isolated communities long free from the disease it is apt to break out, when introduced, with fatal violence, as among the inhabitants of the banks of the river Amazon in 1749, in 1829 in Astoria, in 1846 among the Indians of Hudson Bay territory, in 1852 among the Hottentots at the Cape, in 1854 and 1861 among the natives of Tasmania, and in 1874 at Mauritius.

Such epidemics illustrate the truth of the dictum of Aichdale Reid that people suffer from such diseases at times in the inverse ratio to the racial experience of the disease, *eg*, in Europe severe epidemics are rare, as it is a common disease for generations past, but when introduced as a new disease, among peoples with no ancestral or hereditary experience of it becomes virulent, widespread and fatal, as in Fiji in 1875 and in the Transvaal Buihrer Camps in 1902

ANTI-MALARIAL MEASURES IN MADRAS

We are glad to see that the Madras Government is taking energetic steps to carry out anti-malarial measures in that Presidency. The following extract will show the scope of the measures proposed —

"As stated in the proceedings read above, the Government selected a few localities for carrying out certain experimental operations in connection with the suppression of malaria, and certain local bodies concerned were requested to allot funds for the purpose

2 The Sanitary Commissioner now explains the scope of the operations to consist of—

(a) the filling up, or draining, of pools or the killing of mosquito larvæ by kerosine oil,

(b) the treatment of the inhabitants with quinine and observing microscopically the result of the treatment, and

(c) the undertaking of such minor drainage works as would permanently relieve sub soil and surface water obstacles

3 For carrying out the experiments in the places selected, Lieutenant-Colonel King requested that the services of a commissioned medical officer as well as of an engineer subordinate might be placed at his disposal for a period of six months

4 Whilst Government are aware that the attempt to protect populations against malarial fever by operations which have, for their chief object, the destruction of anopheles larvæ have not proved an unmodified success, they consider it unnecessary that a series of experiments should be undertaken to prove the efficacy of a combination of the well-recognized methods suggested by the Sanitary Commissioner. They therefore accept his statements that the campaign against malaria to attain any fair measure of success must include not only the destruction of mosquito larvæ on pools, but also administration of quinine and minor engineering works to relieve the surface and sub soil water flow. They are disposed to place particular trust on well-considered measures of the latter nature as tending to the securing of radical results. The Government are accordingly prepared at once to see effect given to the scheme as a practical portion of the regular sanitary programme in every Municipality and throughout the jurisdiction of every Local Board in the Presidency. The necessity for including in their sanitary programmes provision for the execution, under the guidance and advice of the District Medical and Sanitary Officer, of operations of the three classes indicated will be inculcated upon all local bodies. The scheme can be applied only gradually as funds permit, but some operations should be prosecuted every year and suitable provision made in the budget for the same

5 When the scheme sanctioned in G O, No 1558 L, dated 7th December 1903, comes into operation, the District Medical and Sanitary Officer will have, at his disposal, a subordinate capable of drawing up plans and estimates for minor sanitary engineering works such as would be required in an anti malaria campaign. Pending the appointment of this additional staff, District

Boards should, for such time as the District Medical and Sanitary Officer shows necessity, place directly under his orders an engineering subordinate capable of levelling, drawing, and making estimates in respect to works of the minor nature required. Necessary instruments and lascaras should be provided. When such operations are undertaken by the District Medical and Sanitary Officer in a municipality, the District Board will recover from the Council concerned the pay of the establishment and other charges incurred, but before operations are commenced, the Municipal Council must have signified its assent and undertaken to meet the expenditure referred to

6 The Sanitary Commissioner should be freely consulted with regard to the proposals of the year. He will be good enough, if he deems it necessary, to draw up a short memorandum for the instruction and guidance of District Medical and Sanitary Officers in the matter

7 A provision of Rs 1,500 has already been made in the budget for the current year by the District Board of Vizagapatam for carrying out operations of the kind in view, and a similar provision of Rs 300 by the Municipal Council of Cochin. The District Medical and Sanitary Officers concerned are requested to submit, with the least practicable delay, after personal investigation, proposals for fully utilizing these allotments in the village of Simhachalam in the Vizagapatam district and in the Cochin Municipality. These proposals should be submitted through the Sanitary Commissioner so as to reach Government not later than 31st August 1904

PREVENTION OF MALARIA BY QUININE KOCH'S METHOD

We quote the following description of Koch's method of using quinine as a prophylactic from the October Number of *Journal of K A M C* —

"This method of Koch differs essentially from the old preventive treatment by quinine. The rationale is that quinine is given to a number of people, healthy or sick, with the idea of preventing their being infected or of their infecting others, with the proviso that Koch only gives quinine to those actually bearing the parasite in their blood

He treats them for several months, two days quinine with an intermission of eight or nine days, until the parasite is no longer found in the blood. It is not necessary to examine them clinically, for the microscope shows who require the treatment, and also when it may cease

Koch commenced his experiments in 1899 at Stephansort, and he now gives the result of experiment in Istria, Italy, the two German colonies in Africa, and at Wilmershaven. P. Frosch has continued Koch's experiments at Brioni, a small island off the coast of Istria, covered with sub-tropical vegetation, and with a climate comparable to that of the Riviera. There are about 300 inhabitants, but they are not permanent residents, and the majority only arrive when the harvest requires gathering

In December, 1900, the blood of the inhabitants was examined, and all those in whom the parasite was found were treated with quinine. In June, 1901, the commencement of the malarious season, an even stricter examination was made, and all those refusing to submit to it were sent off the island. The examination was continued monthly, and every person who arrived on, or left, the island for however short a period was examined anew

The actual treatment consisted of the exhibition of one gramme of quinine [*ie*, 15 grains] for two days consecutively. If fever occurred, or if, without fever, the blood contained large or small annular forms (*grand ou petites formes en anneau*), 7 grammes of quinine were given in five days in 2, 2, 1, 1, 1, gramme quantities. The further treatment was 1 gramme of quinine for two days consecutively, every nine days for tertian, and every

eight days for quotidian cases, for a period of three months. Later still 1 gramme was given for three days consecutively every eight days.

The results of the first year were as follows. Seventeen primary cases of malaria, and three relapses. In 1900 it appears that there were ninety-seven primary cases, thus showing a gain of 85, 5 per cent rendered immune.

In 1902 the experiment was repeated, and this year, 170 fresh labourers were introduced. There was not a single case of malaria amongst them, and there were only one or two relapses amongst the original inhabitants with no primary case.

The author draws attention to the fact that in consequence of his treatment 170 people were able to pass the summer without danger on an island where, formerly, residence for a single night was sufficient to give malaria. He also insists that skilled attention is not necessary, as any intelligent person can collect the blood and send it to a central laboratory for examination, and the quinine can be equally readily given. Finally, the amount of quinine, given in the prescribed doses, to almost all the inhabitants, did not nearly amount to the enormous quantity consumed in former years.

Bludau made the same experiments in 1901, at Osseio (230 inhabitants) and Pentacroce (228 inhabitants). After considerable difficulty in persuading the people to allow their blood to be examined, he finally succeeded, and very few cases of malaria occurred.

Vegedes applied Koch's method in several districts in German South Africa. The results were as follows. At Franzfontein in 1901, out of 279 inhabitants, domiciled and travellers, the blood of 56 per cent contained parasites. Of 175 residents, 75 per cent had parasites. In June, 1902, out of 240 residents, 6 per cent had parasites. Analogous results occurred in other districts.

In the Tuscan Maremma in 1901 and 1902, under P. Gosio, almost equally favourable results were attained, but the conclusion was arrived at that treatment for at least four months was necessary, and he states that the ethyl carbonate of quinine is the best form for children, as it is tasteless.

The author considers that mechanical methods of defence, such as mosquito curtains, are practically useless, and that only under military supervision do they give even favourable results. He gives the following table, presumably tabulated from the Maremma cases —

Mechanical defence only	44	per cent	cases of ague
Quinine alone	16 5	"	"
Untreated	13 5	"	"
	84 18	"	"

He also states that by Koch's method it does not appear to be necessary to recommence the treatment every year.

Martin, who was in medical charge of the employes during the excavations for new docks at Wilmershaven in 1901, by following this plan of treatment, had an ague rate of 5 per 1,000, whereas from 1858 to 1869, when the port was being built, the rate was from 204 to 227 7 per 1,000.

EARLY TREATMENT OF PULMONARY TUBERCULOSIS

In the course of a clinical lecture, delivered at the London Polyclinic (September, 1904), Dr J. E. Squire, C.B., quoted the following two sets of figures as indicating the importance to patients of early recognition of consumption, and the danger of delay in commencing treatment (*vide Public Health*, October, 1904), viz —

(1) From Gomersdorf Sanatorium 5,000 cases

Stage of Disease	Percentage improved
I	58 8
II	21 4
III	3 1

(2) Mount Vernon Consumption Hospital, Hampstead 1,937 cases

Number of Lobes affected	Percentage much improved
1	64 6
2	37 1
3	20 7
4	11 4

He pointed out that there seems to be a want of agreement between experts and the general body of the profession as to the significance of the term "early" as applied to tuberculosis of the lungs, and that, from the various public sanatoria for consumptives throughout the country, there comes the complaint that cases are not sent in for treatment until the disease is already "advanced," and success in treatment, therefore, becomes doubtful.

It is not uncommon to hear that for the early detection of tuberculosis, frequent examination of the sputum for bacilli is necessary, but Dr Squire lays it down as a general rule that when bacilli can be found in the sputum the disease in the lung is "advanced" in the sense that the lung has already begun to break down. In many cases, in the early stages, there is no sputum to examine, he has watched cases of undoubted pulmonary tuberculosis for three or four years, during which time he has never been able to obtain any sputum for examination.

It would appear, thus, that in most cases reliance is to be placed upon the history, symptoms and physical signs. As regards history Dr Squire regards the personal history of the patient, the mode of onset of his present illness, the record of previous illnesses, especially influenza or pleurisy, loss of weight, &c., to be of more importance than his family history, though this should not be neglected.

The symptoms, he showed, might be very indefinite and not especially referable to the respiratory system, but he laid stress on the importance of an occasional rise of temperature or increase of the ordinary pulse rate on slight provocation.

As to physical signs, he pointed out that the difficulty in correctly interpreting these is increased by the fact that some difference in the percussion note, breath sounds, and fremitus, when one side is compared with the other, is not incompatible with perfect health, as evidenced by the following results of the examination of over 100 healthy persons recently carried out by him (largely in connection with life assurance) viz — some difference in the percussion note, over some part of the apex was observed in nearly half of the cases. The breath sounds were equal on the two sides in 73 per cent, and louder at the right apex in 22 per cent, whilst vocal resonance and fremitus were more marked over the right than over the left apex in nearly 80 per cent of the persons examined.

Notwithstanding these difficulties in the way of early diagnosis, the magnitude of the interests involved supplies a strong incentive to the exercise of the most searching endeavours

for securing early recognition in all cases in which the clinical condition, or the personal or family history, gives grounds for suspicion

PHOSPHATIC CALCULI AND ACTION OF UROTROPINE

IN the *Annales des Maladies des Organes Genito-Urinaires* for 1st July, 1904, is a long and comprehensive paper by Dr T P Guaiard on the pathology, mode of formation, symptoms, diagnosis, course, and tendency to recurrence, treatment—curative and preventive—of phosphatic calculi of the bladder, of calculi, that is to say, forming, in the majority of cases, as complications of prostatic enlargements associated with septic infection and incomplete retention

The whole paper is of great interest, but the following points representing some of the author's personal conclusions, are of chief importance and especially should attention be directed to the high value placed by Guaiard upon urotropine as a preventive to formation or reformation of such phosphatic stones

1 The diagnosis of such calculi by direct exploration, though rendered at times almost impossible by an excessively prominent middle lobe of the prostate, may be remarkably simplified by placing the patients in the full Trendelenburg position. By this means, the fundus of the bladder becomes the most dependent part the calculi fall down of their own weight, and can be very easily found by metallic sound or by lithotrite

2 The recurrence of this calculi is very common. It is necessary, therefore, to take steps to prevent their reformation. The classical means, catheterism, washing out the bladder with boric acid, and the like, though useful, are far from being reliable enough. We now possess, however, in urotropine, an agent well meriting the greatest confidence. It is the most powerful antiseptic of the urinary apparatus. While actively counteracting the development of micro-organisms, it limits or controls the two factors essential to the formation of phosphatic calculi, viz (a) the alkaline or ammoniacal re-action of the urine and the resultant precipitation of the salts, (b) the transformation of the pus into a viscid agglutinated mass which would tend to englobe the precipitated salts. Guaiard reports the case of a patient who had submitted to lithotomy twenty-two times in the space of ten years, but who was afterwards treated energetically and perseveringly with urotropine, no further recurrence of the calculi taking place (the cure had been maintained, in fact, for three years—up to the date of Guaiard's paper). The author thinks that this case furnishes the clearest possible proof of the really preventive action of the drug. Urotropine may be given in doses of half a gramme every six hours—1.5 grammes to 2 grammes in the twenty-four hours (20 to 30 grains)

3 If, in spite of the most methodical *lavage*, and the prolonged administration of urotropine, recurrence continues to take place, it may still be possible to avoid recourse to the graver operative procedures by submitting the patients, at regular periods of four to five weeks, to what Guaiard terms "séances préventives" of thorough *lavage*, and aspiration of the bladder contents through the large evacuating sound or catheter which one employs for lithotomy. This is the surest method of encouraging the passage of recently formed calculi which, though inoffensive by reason of their still minute size, would still inevitably grow, and at no distant date give rise to troublesome effects

4 Perineal prostatectomy, according to the author, is likely to afford the best guarantee against the formation of secondary calculi. It will certainly be effective in the cases where sepsis has been completely got over, it may even be so in a good number of those cases where infection recurs or continues. Some, however, of these will remain indefinitely infected, even though freed from all retention by the sacrifice of their prostate, and, consequently, there will be still the risk of recurrence of the calculi

It will be necessary in these cases to follow out the various preventive means already described, means which therefore should be sufficiently guarded and appreciated—(*Glas Med Journal*)

THE Government of India has published Simla, 24th October, 1904, a useful set of rules for the instruction of Surgeons of emigrant ships in dealing with cases of tuberculosis

DR CROPPER writes from Palestine to the *Lancet* on the following easy method of obtaining exflagellation of the malarial parasite—

"Having till recently failed to get exflagellation in crescent infection I have lately used a method which has proved both simple and very efficacious. This consists in mounting a drop of blood of the usual size on a slide wetted with ordinary cold water held at an angle so that no excess remains. This is quite easily done by a brush or with the finger and the least possible quantity of water is sufficient. The blood is not otherwise "mixed" with water. The red blood corpuscles no longer show a tendency to form rouleaux and the process of exflagellation is the more easily observed. The red corpuscles do not undergo any notable alteration but the leucocytes become a good deal more refractive. Having had no success by the method of breathing on the cover slip, &c, I at once got exflagellation in the first three cases of crescent infection and the first case of tertian fever with gametes was also successful. Tertian fever is common enough here. Since writing the above I have today had a case of quartan fever with abundant rosettes in which well-marked exflagellation was seen."

PROFESSOR RIEDEL of Jena, has a valuable article, translated in the *Glasgow Medical Journal*, on the operative treatment of appendicitis. He sums up as follows—

"Where in reality an attack of appendicitis sets in, the pain is almost always intense, and false diagnoses

are rare. But whoever believes that he can tell in any particular case whether there is present a purulent or non-purulent appendicitis, or whether a purulent or a gangrenous form is present, is much deceived. We are always open to the risk of removing an appendix which may only be the subject of appendicitis seriosa, but chronically diseased. This does no harm to the patient, on the contrary, is of service to him. Though I said on a former occasion that, "according to the statistics of doctors, 50 per cent of the patients required no operation, because the disease ran a mild course," I did not say that I would not operate in 50 per cent of the cases. I have always operated on those patients in whom the diagnosis was assured, and will continue to do so, for I can never be sure how the disease will progress in its future course.

Appendicitis is a surgical disease, it is to be treated on the appropriate surgical principles. Therefore, increase of the white blood corpuscles is not to be waited for before operating, operation is to be done before they increase, and thus death will be an exceptional result of appendicitis."

Professor Riedel did 86 such operations in six months in 1903.

A VERY interesting paper appeared in the October issue of the *Journal of Hygiene* by Dr Erik Ekelof, the Medical Officer of the Swedish Antarctic Expedition, from October 1901 to January 1904.

This expedition, like that of Nansen's *Furthest North*, escaped from scurvy, while the British Expedition which operated simultaneously, under Commander Scott suffered, though slightly, from what is described as "undoubtedly scurvy."

It is well known that the scurvy of Polar Expeditions by no means depends solely on the absence of vegetables or lime juice. Prof Torup of Christiania formulated the theory that scurvy on these expeditions was due to a kind of poisoning—"that by a peculiar and slow decomposition, taking place in badly preserved, e.g., badly salted, meat and fish, there are formed poisons, nearly related to the ptomaines, through the continued consumption of which the disease is created." Dr Ekelof says this theory cannot be true in its entirety, and he believes that scurvy in these expeditions is due to the absence of fresh meat, and concludes that all tinned and salted food should only be looked upon as a reserve, and in all Polar expeditions provision should be made for large supplies of fresh meat, to be kept unsalted and unprepared, merely hung up in the open air. This is in accordance with Nansen's experience when he and his companion lived a whole long winter on the fresh meat of the seal and bear.

A RECENT article (*Lancet*, 17th Sept 1904) by Dr Ricketts and Dr Byles, of the Small-pox Hospitals of the Metropolitan Asylums Board, show pretty conclusively that the red light treatment of small-pox is a failure, and that it does not prevent the fever of the suppuration stage.

DR A. LINGARD, the Imperial Bacteriologist to the Government of India, has published a valuable report on the preparation of Rinderpest Protective Serum, based on experiments undertaken at the Muktesai Laboratory.

CAPTAIN C. B. LAWSON, R.A.M.C., gives an account of some cases of Bilharzia Disease among soldiers at Woolwich. Since the South African War there must be numerous cases all over the British Isles. Have any cases been observed recently in India? We remember hearing of one case, but the medical officer in charge, though he had served in Natal, scouted the idea. The diagnosis is easy as the blood and ova in the urine can hardly be mistaken. We remember several cases at Netley in 1887.

A VALUABLE article on the value of blood examinations in case of ankylostoma and other worm affections, by Dr A. E. Boycott appeared in *Journal of Hygiene* for October 1904. He advocates this method of diagnosis, in preference to examination for anaemia, or to examination of the faeces for ova. He shows that in ankylostoma infection there is a marked increase in the eosinophile leucocytes. The paper is too long to satisfactorily summarise, but should be read by all interested in such cases.

IN the *American Journal of the Medical Sciences* (September 1904), Dr Poud of Iowa has an article on two cases of ascariides in the bile ducts, stimulating gallstone seizures. There were no special symptoms which might have led one to suspect the presence of ascariides, the clinical picture was purely one of biliary colic, and combined with the quickly developing jaundice presented a typical case of obstruction of bile from whatever cause.

Reviews

The Anopheles Mosquitoes of India—By Capt S. P. JAMES, I.M.S., and Capt. W. GLEN LISTON, I.M.S. Calcutta: Thacker, Spink & Co. 1904.

UNDER the above title Captain S. P. James, I.M.S., and Captain W. Glen Liston, I.M.S., have published a handsome volume which will be of the greatest value and interest to all who are working at the subject of mosquito-malaria in India.

We have no hesitation in saying that this is the most valuable monograph we have yet seen on the mosquitoes of India. It is beautifully got up, well printed and very thoroughly illustrated. The figures in the text, the half-tone plates and the really beautiful coloured plates at the end of the book are all works of art, and Messrs Thacker, Spink & Co. are to be congratulated on their success. We understand that

the figures in the text and the half-tone plates facing the text have been done in Calcutta, and they are exceedingly good. In all there are 44 illustrations, all good, but we believe the large coloured plates of the 14 most important anopheles have never been surpassed. The text of the book is divided into two parts: the first consists of four chapters, discussing a general account of mosquitoes, the collection and identification of mosquitoes and then larvæ, the habits of Indian Anopheles and a classification of anopheles. Part II gives systematic descriptions of the anopheles mosquitoes found in India, *viz*—*Anopheles barbirostris* and *A. nigerrimus*, *A. leucophyrus* and *A. punctulatus*, *A. pulcherrimus* and *A. willmeri*, *A. kaiwari*, *A. fuliginosus*, *A. jamesi*, *A. maculipalpis*, *A. theobaldi*, and *A. maculatus*, *A. jeyporensis*, *A. listoni*, *A. culicifacies*, *A. tosi* and *A. stephensi*, *A. turkhandi*, *A. ludesayi*, *A. gigas*, *A. aitchisoni*, and *A. immaculatus*, *A. culiciformis*. Each of these ten groups are collectively and separately described, and by constant reference to the coloured plates it is quite easy to follow the descriptions and to learn the differences.

On the important question of classification our authors have much to say. They do not accept Theobald's classification and medical men who are not professed entomologists will feel grateful to Captains James and Liston that they have avoided the cumbersome and difficult nomenclature put forward by Mr Theobald in his great monograph. *From our point of view* it is infinitely preferable to have a description of and be able to recognise *A. tosi*, or *A. culicifacies* under this title than to have to remember such names as *A. myzomyia tosi*, or *myzomyia culicifacies*. The fact is, it cannot be said, that all uncertainty has been eliminated from Mr Theobald's classification, and even the author himself in one instance, it is stated, classified the same mosquito as belonging to two different supposed genera.

Our authors do not believe that any final classification is at present possible, and hence they have divided the Indian "anopheles" into ten groups, each group containing closely allied forms. The characters of each group are first given, and then each mosquito is clearly described, the language being clear and free from bald technicalities.

We have no hesitation in recommending this handsome and valuable monograph to all our readers interested in the subject of malaria prevention. It is complete, and clearly written, and is sure to have a wide circulation in India and beyond.

Practice of Obstetrics—By Professor J CLIFTON EDGAR (Cornell University) Sec. Ed., pp xviii and 1153. With 1264 Illustrations including five Coloured Plates, and 38 figures printed in colours. Rebman, Limited. Price £1-10.

FROM a general standpoint it may be said that the rapid sale of a work does not necessarily

constitute any criterion of its intrinsic value, but scientific monographs rarely run out of print within a short space of time unless possessed of a high order of merit, and this fact might safely be applied in an absolute degree to a treatise on so universally comprehended a subject as the science of obstetrics.

The exhaustion, therefore, of the first edition of the above work, within four months of the date of its publication, bears voluminous testimony to the success which has crowned the efforts of Professor Edgar to present an exposition of the subject with special reference to its practical and clinical aspects.

In the present edition, notwithstanding the brief period at the author's disposal for revision (1) a new section on the Toxæmia of Pregnancy has been added under Pathological Pregnancy; (2) the section on Fever in the Puerperium in Part VIII of the first edition has been entirely rewritten and brought up-to-date under the heading of Morbidity in the Puerperium, (3) three new coloured plates have been added (two of the toxæmia of pregnancy, and one of the stools of healthy breast-fed infants), (4) many of the old illustrations have been re-drawn and forty-five new ones added, and (5) the author's position regarding the indications of Embryotomy and Cæsarian Section have been restated as, from the standpoint of laboratory and theoretical obstetrics, his views were apparently misunderstood and therefore unfairly criticized.

The work is divided into ten parts, *viz*—I. The Physiology of the Female Genital Organs; II Physiological Pregnancy, III Pathological Pregnancy, IV Physiological Labor, V Pathological Labor, VI Physiological Puerperium; VII Pathological Puerperium, VIII The Physiology of the Newly Born, IX Obstetric Surgery. An appendix containing ten illustrations deals with private history records and institutional records.

At the beginning of each part there is a table of contents of the part, and each section of the different parts is also provided with a sub-table indicating its subject-matter. Particular prominence is given to the relation of tuberculosis to pregnancy, the teeth in pregnancy, anti-natal pathology, monstrosities, labor in elderly primiparæ, prophylactic diet in foetal dystocia, prematurity and asphyxia of the newly born, diseases of the newly born, posture in obstetric operations, cephalometry, a new method for illustrating the mechanism of labor, pelvic deformity, and morbidity in the puerperium.

The reception by the profession of the first edition augurs well for the future of the present edition, and we have no hesitation in recommending it as one of the most complete of modern text-books, scientifically accurate and thoroughly up-to-date.

The handsome appearance of the volume and the excellence of the type and illustrations reflect the greatest credit upon the publishers for the

care and pains which the undertaking must have involved, and both they and the author are to be heartily congratulated.

The work is dedicated to Professor Edgar's obstetric students of the past fifteen years, the avowed aim being to present the subject of midwifery from a practical standpoint, so as to minister not only to the requirements of the student of medicine, but also to the obstetric practitioner.

A Text Book on Physiology—By ISAAC OTT, A.M., M.D., Professor of Physiology in the Medico-Chirurgical College of Philadelphia. With 137 Illustrations. Royal octavo, 563 pages. Bound in Extra cloth. Price \$3.00 net. F. A. Davis Company, Publishers, 1914-16, Cherry Street, Philadelphia, Pa.

THIS new work on Physiology has been written at the solicitation of students who have attended the author's lectures for the past eight years.

Professor Ott states in the preface that his aim has not been to write a treatise on the subject, but rather an elementary work containing the chief facts of physiology which are necessary to the student who wishes to apply them in the practice of his profession.

We may say at once that, after a careful reading of this book, we rose with a feeling of disappointment. We do not think that the work comes up to the standard of knowledge of physiology required from students of medicine in this country, and it is not likely to supersede the many excellent books of a more or less elementary nature on physiology at present on the market. It does not appear to us to suit the requirements of any class of students in India as it is much too large and elaborate for those preparing for the lower grade examinations and quite inadequate for those reading for the higher examinations.

The author states that physiology is the basis of medicine, and its understanding is requisite to the study of pathology. He touches more or less lightly on most of the essential facts of his subject, but in very many cases we find the details most meagre, and we question very much if students could obtain—from this work—the thorough grasp of physiology necessary for the proper understanding of medicine and pathology.

The book deals fairly fully with the histological features of the different tissues and organs of the body—this is specially marked in the descriptions of the anatomy and histology of the central nervous system and of the organs of special sense, but, on the other hand, the account of the physiological properties of these tissues and organs is extremely brief and insufficient.

The chapter on Digestion, although short, gives a very good account of the essential points in a readable form. It is up-to-date in the information it contains giving some of Pavlov's

experiments and results, and also a paragraph on the more recent work on the Succus Entericus and Entero-kinase.

The chapters on Internal Secretion and Animal Heat are also interesting from the fact that Professor Ott has done a large amount of experimental research work on these subjects.

We notice that the author still adheres to the old localization of the so-called motor centres in the Rolandic area of the cerebral cortex, although Sherrington and Grünbaum's work on this subject has been published over two years ago.

The book is exceedingly well produced, we have nothing but praise for the way in which the publishers have done their share of the work. The diagrams are good, and the printing and paper most excellent.

The Nervous Affections of the Heart—By George Alexander Gibson, M.D., D.Sc., &c. Publisher Young J. Pentland, Edinburgh and London. 99 pages.

THIS book is a reprint of the Moulson Lectures delivered in Edinburgh in 1902 and 1903. The first three lectures are on Angina Pectoris, in which term are included all sensory disturbances of the heart from the slightest to that which ends suddenly in death. The first lecture is clinical and deals fully with the symptoms and causes of the disease, the second considers the pathological aspects of the subject, details the connections of the cardiac with cranial, cervical and the upper thoracic nerves, and in the light of these connections enters into Head's explanation of the referred pain and the cutaneous tenderness which may be found in this as in other visceral disturbances. The connections of the cardiac plexuses lead similarly to the explanation of a right and a left sided angina (which the author in common with many others recognises) due to stress of the right and left ventricles respectively. The third lecture is upon the treatment of angina. The author considers that the sensory affections of the circulation are wonderfully amenable to careful management and goes very fully into the principles and details of treatment. After noting and advising as to the removal of attendant conditions which may underlie or induce the paroxysm, he enters into the consideration of its relief by agents acting directly on the circulation, and notes the relative values of vasodilators, stimulants, anodynes and respiratory exercises in relieving and in warding off seizures. After this general advice he gives details as to the management of the various forms of angina pectoris.

The last three lectures are respectively upon the rate, the rhythm, and the force of the heart's beat, and there is of necessity some overlapping and repetition. In the first of these lectures allusion is made to the different alterations in rhythm and force produced by stimuli applied to the sinus venosus, auricle, or

ventricle, which produce premature imperfect systole. Bradycardia and tachycardia are dealt with fully and form an interesting study, and reason is given for believing that in some cases the former is due to premature imperfect systoles not strong enough to raise the aortic valves and force a pulse wave into the radial artery. Paroxysmal bradycardia, or Stokes-Adams' disease he believes to be due to sclerosis of the cerebral vessels. In the lecture on rhythm two types are recognised, the one due to the presence of an early premature systole, which may be rhythmic or arrhythmic, and the other due to lengthening of the diastole which is almost always absolutely arrhythmic. The pulsus paradoxus is well illustrated and explained, and there are some interesting pages on hemi-systole, reason being given for thinking that this may be either right or left sided. The last lecture on the force of the heart's beat deals with palpitation and tremor of the heart as well as with syncope and asystole, the last two are separately considered, although no clinical differentiation between them is attempted. The book contains 35 figures which add greatly to its value. In conclusion, stress must be laid on the fact that throughout the lectures treatment is given a very prominent place, and is dealt with in a manner admirably clear and full, a fact which will make the work specially useful to the Civil Surgeon in India.

The Nutrition of the Infant—By RALPH VINCENT, M.D., M.R.C.P., Physician to the Infants' Hospital, late Senior Resident Medical Officer, Queen Charlotte's Lying-in Hospital, London. Second Edition. Baillière, Tindall & Cox, 1904. Demy 8vo, pp. xx+321. 10s 6d net.

THE first edition of this work was only published early last year and was reviewed in the March Number of this Journal. The fact that a second edition has been called for in so short a time is ample proof that the book has met a distinct want. In this edition "the text has been carefully revised and various supplementary facts and considerations have been introduced" as stated by the author in his preface. A chapter on Milk Depôts and their organisation has been inserted. There is little to be added to what has already been said in the full review of the first edition.

The subject of Infant Feeding is one of the greatest importance, especially in India, where mothers are so often either unable or unwilling to nurse their children, and the works on the subject are few and not altogether satisfactory. A considerable part of this book is taken up with descriptions of the various methods (chiefly laboratory) whereby cow's milk can be manipulated, so as to more nearly resemble human milk, in the relative percentages of its various ingredients, but however much the mixture may be made to resemble the human secretion chemically, it must be remembered

that it can never be really converted into the same fluid as the natural secretion. The principal is undoubtedly sound, but the methods described are distinctly complicated and could only be carried out, in this country at least, with great difficulty. In addition to these descriptions there is much valuable information contained in the work, more especially in relation to the normal development of the infant and the various disorders commonly met with attributable to faulty feeding.

The chapters on milk supply, bacteriology of milk and milk depôts will be found to give many useful hints, and, if only they call attention to the great need of stricter supervision of the milk supply, will do a great work.

In conclusion, we can most heartily commend a perusal of this book to all those who wish to keep themselves abreast of the modern theory and practice in regard to the feeding of infants.

The Differential Diagnosis of Syphilitic and Non-syphilitic affections of the Skin including Tropical Diseases—By GEORGE PERNET. Adlard & Son, Bartholomew close, London, E.C. Pages 219. Price 6s 6d net. 1904.

THE division of skin eruptions into syphilitic and non-syphilitic, though perhaps a trifle crude, is nevertheless of practical value on account of its bearing upon treatment, and Mr. Pernet has carefully described all the various forms of syphilitic manifestations and contrasted them with those non-syphilitic skin diseases with which they are likely to be confounded. The differentiation of the stages of syphilis, in the order of their appearance, from other affections is described beginning with the primary soil, the chapter on extragenital chancres is particularly good. The diagnosis from leprosy and yaws is also well described, the arguments as to whether yaws is a form of syphilis or not is lightly touched upon, the author is sceptical as to the non-occurrence of syphilis in Fiji, and holds the view that they are two distinct diseases. The book is well written and contains many useful practical points, for one, stress is laid on the importance of looking at a skin eruption as a whole and not attempting to make a diagnosis from a single area. The importance of other symptoms not connected with the skin is also insisted upon. The work should be of value to those whose experience of skin diseases is not great and also when a rare form of eruption is met with.

Food for the Tropics—By T. M. MACKNIGHT. London: Thacker & Co. Calcutta: Thacker, Spink & Co. 1904.

THIS little book is written by a tropical produce merchant to point out the various kinds of products found in different countries, the local names they bear, the properties they contain, how they can be utilized for the purposes of food.

Under the general heading 'Bread' will be found brief and reliable accounts of Guinea

corn (*guar*), maize, manioc, rice, sago, tapioca, plantain, &c Under the heading potatoes are descriptions of cassava, taro, yam, and the sweet potato Chapter IV deals with grain, pulses, nuts, beans, &c The next chapter gives an account of the various oils, then comes a description of 16 vegetables, a good chapter on sugar and sugar palms, and Chapter VIII deals with tropical fruit After this there is an account of such beverages, as cocoa, kola, coffee, &c, and a description of a large number of condiments

The book on the whole is useful, and though to the medical man other sources of information are open as to these articles of food, yet it is useful to have the information collected into one small volume, and for this reason we can recommend the book

Saunders, Question Compend No 20 Essentials of Bacteriology.—By M V BALL, M D, formerly Resident Physician at German Hospital, Philadelphia Fifth Edition Thoroughly revised By KARL M VOGEL, M D, Assistant Pathologist at the College of Physicians and Surgeons (Columbia University), New York City 12mo Pages 343 Illustrations 96, some in colours Plates 6 Philadelphia, New York, London W B SAUNDERS & Co 1904 Cloth, One dollar net

THIS small work is a short treatise on the more important elementary facts and theories in Bacteriology It is divided into two parts The first, dealing with general considerations and technique, includes the more common methods of examination, staining, culture and inoculation of bacteria, together with a very brief consideration of infection, immunity, and animal experiments The second part deals with special Bacteriology, including non-pathogenic, as well as pathogenic organisms, with a short account of the origin, form, growth, staining properties, etc, of each individual organism This is succeeded by an Appendix dealing with Yeasts and Moulds, a short summary of the examination of air, soil, water, &c, followed by tables of the Chief Characteristics of the Principal Bacteria The book, as stated in the preface to this edition, is intended primarily, as an aid to students, and we would say it certainly will fulfil this purpose

It presents the elementary facts of modern bacteriology in a clear and concise form and will doubtless also be useful to the busy practitioner It is handy in size, well printed and bound, and the plates are very well executed

Correspondence.

MYXEDEMA IN INDIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—With reference to your footnote on the case of Myxœdema published in the *Indian Medical Gazette* for November, I may state that I had under me in the Dufferin

Hospital at Rae Bareilly, two years ago, one of the most typical cases of myxœdema I have ever seen The patient was a woman, Maharaja by name, æt 35, and the symptoms were as follows —Marked increase in the general bulk of her body firm inelastic swelling of the skin, obliterating the lines of expression in the face, the features being coarse and broad, the lips thick, the mouth enlarged, giving the face a dull vacant look There was very marked slowness of thought and speech, defective memory, the gait was heavy and slow, and she was unable, except with difficulty and great exertion, to mount the three steps to the outpatient-room She came to the hospital complaining of amenorrhœa and loss of strength, and had noticed the gradual alteration in her features The thyroid gland was markedly diminished in size, and she suffered sometimes from tachycardia She was treated with the dry powdered thyroid gland regularly, and with general tonics, and I must say there was great improvement in her condition She was in hospital two or three times afterwards for a month or six weeks at the time, and always improved under treatment For the last few months she has been lost sight of This is the only case I have seen in India

Yours, &c,

H AUSTEN SMITH, M B, B C (Cantab), M R C S.,

MAJOR, I M S.

MYXEDEMA IN INDIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In response to your query in the November issue of the *Indian Medical Gazette*, I send the following brief and I regret to say, rather incomplete notes of four cases of myxœdema in natives of India, which I have met with during the last eighteen months

Case 1—Mahomedan labourer, about 40 years of age Ill two years Principal complaint was pain in limbs, fever (?) at night and constant headache Another complaint was running from the nose for three years Unable to work

The hands were thick and broad Face and legs swollen, though not pitting on pressure The swelling was specially noticeable in the calves, which were about twice the presumably natural size He had the characteristic thick slow speech of myxœdema When put on thyroid gland all his symptoms rapidly disappeared, including the running from the nose, and he was able to resume work During the last eighteen months, he has stopped the thyroid on five occasions, when he soon relapsed, more or less into his former condition with swelling of the limbs, &c, but quickly improved again on resuming treatment

I have lost sight of him for some months

Case 2—Mahomedan labourer, about 40 years of age Ill 18 months Complained of pain in limbs Unable to work Hands and feet swollen, but did not pit on pressure Calves much swollen, the right somewhat larger than the left, measuring 19 inches in circumference Features heavy, speech thick Rapidly improved under thyroid gland and was able to work This patient also stopped treatment five times during the last year, and on each occasion his symptoms returned, but disappeared again on his returning to the thyroid gland treatment

I have lost sight of him lately

Case 3—Hindu merchant, aged 46. Made no complaint himself, but was brought by his relatives, who stated that for three months he had shown indifference to his business, which had to be conducted by others, that he had lost his memory to a considerable extent, that he spoke more slowly than formerly, and, though quite sensible, seldom spoke, except when spoken to He had grown much stouter for six months, and became better tempered

The features were heavy, the skin dry, and was described as appearing like snake skin Hands, feet and legs appeared swollen, but did not pit on pressure The urine was free from albumen He was put on thyroid gland, and during the few days he was under observation, there was a slight loss of weight, increase in amount of urine, and diminution in size of hands and legs, as shown by measurement He then went away to his home, which was at a considerable distance, having been directed to continue the treatment I have not heard anything further of him

Case 4—Hindu shop assistant, aged about 50 Had been obliged to give up work for six months owing to mistakes made in writing and counting His son stated that the patient had become forgetful and irritable, that his face had become swollen for one month, and that the urine was diminished His speech was thick and of a character suggesting myxœdema, though his son said he used to speak quite clearly The skin was very dry and inelastic, but, except on the face, there was no noticeable swelling The urine contained no

albumen He was put on thyroid gland, but I lost sight of him after a few days and am unable to say whether there was any improvement

I am, &c ,

C H S HOPE, M D , Ch B

PUBNA, BENGAL, }
Nov 21st, 1904 }

FATAL CASE OF BEE STING

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR—I crave permission to put the following case in your paper which I trust has as unique importance considering the extremity of it, and that instances are not to be found usually in medico legal literature—

Ram Dayal, 65, H M The patient, an old man, a retired police constable, was brought in a litter by his friends to one Sudder Hospital at 6 30 P M on 27th February 1903 It was stated by the friends that there was a big bee hive in a jungle near a tank, by the side of the way leading to it The hive was on the branch of a tree which had lots of stont jungly creepers hanging down from it. It so happened that the old man was going by the way and a cow was grazing near by with its calf The sight of the old man frightened the calf and it rushed into the jungle the cow following in haste and running through the creepers The bees got violently disturbed through some of the creepers brushing or beating the hive or somehow shaking the branch where the hive was attached A swarm of bees came on the old man who was bitten all over In acute agony he flew into the tank screaming, then he got out of it and rolled on the sandy bank tossing and screaming in a most piteous fashion This drew his friends to his assistance who removed him to a shelter The screams soon gave place to a constant moaning and the tossing to general clonic-convulsions, and these came on in an hour after the bite Consciousness gradually disappeared, and with it the moaning, the convulsions persisting with increased severity The face the chest, the back and the neck became swollen This stage was reached in five hours, and then he was removed to the hospital

When I saw him first the face, the neck and the chest were swollen The swelling was of a diffuse nature and generally not much, being only rather marked about the face and temples He was totally comatose and having constant clonic convulsions like the clonic stage in a fit of epilepsy The convulsions were regular and extended over the upper extremities, the muscles of the neck, the flexors being more affected than the extensors The convulsions were also present over the muscles of the face, the articularis palpebrum of both eyes having violent spasms and the eye balls rolling constantly from side to side (with a slight twist) in a spasmodic fashion The lower extremities were in a state of steady tonic contraction and felt quite rigid, but fibrillar twitchings could be seen here and there The pulse could only be felt in the carotids and was extremely soft and accelerated almost to extinction The respirations were hurried, 60 per minute The diaphragm shared in the clonic convulsions and the inspiratory attempts were like so many repeated hiccups with some snorting at their ends To all appearance the patient was moribund At home the friends anointed him all over with mustard oil In hospital he was given some cardiac stimulants to no avail, and he died convulsing in half an hour, the heart and respiration failing simultaneously No urine could be got for analysis No post mortem could be obtained

REMARKS.—The kind of bee was the bigger variety of the *apis mellifica* which are nearly as big as the wasps and form hanging hives The bites of these insects are known to give immensely more smarting than the smaller variety which generally makes hives in clefts and hollows of trees The poison of the bee in excess dose appears to be a very powerful cerebro spinal irritant as demonstrated in the present case The convulsions set in very early and persisted till he died It is quite likely therefore that the cardiac and respiratory failures were mere secondary, and were due to the vigorous exercise which their mechanisms were obliged to share and keep up beyond their capability in a chaos of disorderly nervous dynamics

Sept 28th, 1904.

Yours, etc ,

H N GHOSH, M D ,

Asst - Surgeon, Rampore Boalia.

OIL OF EUCALYPTUS IN CHOLERA

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In the epidemic of cholera that broke out at Chanchal and a neighbouring village in the month of May 1904, thirty-three patients sought medical relief from the

Chanchal, Charitable Dispensary Of these thirty three patients, twenty five were Hindus and eight were Mahomedans The Hindus that suffered were all from the low classes, There were twelve deaths only As the people here hide the disease, the most of these thirty three cases came to our notice in the collapse stage.

The treatment adopted in all the cases was the administration of Oil of Eucalyptus with mucilage and syrup, the oil was given in five-minim doses to the adult It did not produce any nausea and the taste, sweetened with syrup of lemon, was not unpalatable. It was in three cases that the sulphate of strychnia was hypodermically injected and of these two were fatal

The percentage of recovery was sixty three The treatment deserves a fair trial, the oil acting both as an antiseptic and stimulant.

Yours, etc ,

CHANCHAL

HARI CHARAN BANERJI

[Some years ago Major Harold Browne I M S., reported on the great value of eucalyptus in cholera, during an outbreak in Behar—Ed, I M G]

Service Notes

DR HOHLBECK writes from the seat of war that the Russian surgeons are adopting Zoega von Manteuffel's advice to use gloves in field surgery They find them very convenient for applying dressings in severe cases and for operations of all kinds, carrying a supply constantly with them, each pair sterilized in a separate bag He mentions the great benefit derived from Semm's adhesive plaster fastenings for dressings Thus, with the smallness of the wounds made by the bullets, reduces the amount of dressings to the minimum, so that one small package will serve for an astonishing number of wounded The means of transporting the wounded, according to Hohlbeck, are deplorable, the native carts are so clumsy and too short to lie down in The carts supplied by the Red Cross are fine They are such as are used in Finland, and have proved so useful that a large consignment has been ordered The penetrating dust and the millions of flies are the chief enemies of the surgeon The wounds made by the shrapnel balls are the most serious Each bomb contains about 260 balls, and the injuries made by them have all the disadvantages of the old lead bullets The other bombs are much less dangerous They explode with such force that they fly into such small pieces that the damage inflicted is comparatively slight The wounds made by the Japanese bullets are less serious than those of the Lee Metford or Mauser bullets as he observed them in the Boer war They can even pass through the shaft of a bone with out solution of continuity Dr Hohlbeck's letters are being published in the *St Petersburg Med Wochl*

CAPTAIN F O N MELL, I M S., is reappointed Superintendent of the Central Jail, Nagpur, C P

HONY CAPTAIN J PRENTIE, I S M D., is appointed Civil Surgeon, Bhandara

CAPTAIN H AINSWORTH, I M S., made over charge of Shapur, Punjab, to Assistant-Surgeon Diwan Ali

THE following Assistant Surgeons of the I S M Department have been awarded silver medals for long service and good conduct, viz —W D Bartley, C B Monisse, D W Ross, J Robertson, J A Hogan, J T Parker, P H Rodrigues

MAJOR E A W HALL, I M S., on his return from leave was put on special duty to inquire into the unhealthiness of the Bahsira Valley and into the prevalence of *Lala azar* in South Sylhet.

E L SHUNKER is promoted to be a Senior Assistant Surgeon and Honorary Lieutenant.

LIEUTENANT H R DUTTON, I M S., is appointed to the officiating medical charge of 2nd (Q O) Rajputs, Calcutta.

CAPTAIN CAMPBELL DYKES, I M S., is appointed to the officiating medical charge of 7th Rajputs.

LIEUTENANT A T PRIDHAM, I M S, is appointed to the officiating medical charge of 18th Infantry

THE services of Major C A Johnston, I M S, are replaced at the disposal of the Commander in Chief

THE services of Lieutenant-Colonel R James, M B, I M S, are placed at the disposal of the Government of Madras

THE following I M S officers have been appointed Fellows of Calcutta University—Lieutenant-Colonel G S Rankin, M D, Lieutenant Colonel G F Harris, F R C P, Colonel S H Browne M D, C I E, Lieutenant Colonel J Lewtas, M D, Major R. Bird, M D, F R C S, Major F J Drury, B A, M B

MAJOR C H BEDFORD, M D, D S C, I M S, has been put on special duty under the Finance Department from 29th October 1904

LIEUTENANT COLONEL W G P ALPIN, M D, goes back to military duty

MAJOR G J H BELL, I M S, has taken over charge of the Lunatic Asylum, Rangoon

MAJOR B J SINGH, I M S, is appointed Superintendent, Insein Central Jail

CAPTAIN A FENTON, I M S, is appointed Superintendent, Rangoon Central Jail

CAPTAIN A MOORHEAD, I M S, is appointed Civil Surgeon of Jhelum

CAPTAIN McKECHNIE, I M S, was posted as Civil Surgeon, Umballa

MAJOR A. BUIST, I M S, was appointed Civil Surgeon of Amritsar

MAJOR CLEVELAND, I M S, has been selected to go to Kabul, as Medical Officer

CAPTAIN TURNBULL, I M S, recently returned from Tibet, was appointed Medical Officer of the Mission to Kabul

ON return from leave Captain J N Macleod, I M S, is posted as Civil Surgeon of Quetta

CAPTAIN O H BOWLE EVANS, I M S, is posted as Agency Surgeon in Harauti and Tonk

HONORARY CAPTAIN J MOORE is permanently taken on in that rank

MAJOR E R. G. WHITCOMBE, I M S, was granted leave from Parachinar N-W F P, for one month and ten days from 10th September 1904

MAJOR H F WHITCHURCH, V O, I M S, has assumed charge of the Civil Medical duties at Chitral. It will be remembered that it was at Chitral in 1895 that Major Whitchurch won his Victoria Cross

CAPTAIN O H WATSON, I M S, took over the Civil Medical duties of D I. Khan District on 15th October

CAPTAIN E C HEPPEL, I M S, took over the Civil Medical duties at Miranshah (Tochi) on 16th October

THE services of Captain H B Meakin, M D, I M S, have been placed at the disposal of the Military Department. We are glad to hear that Captain Meakin has recovered from his serious illness and is able to return to duty

THE services of Lieutenant-Colonel W G H Henderson, F R C S I, I M S, are replaced at the disposal of the Government of Bombay

CAPTAIN T G N STOKES, I M S, has been granted three months' extension of leave by the Secretary of State

CAPTAIN H J WALTON, I M S, on return from special duty with the Tibet Mission, reverts to civil employ in the United Provinces and is posted as Civil Surgeon of Gonda

MAJOR T W A FULLERTON, I M S, is posted as Civil Surgeon of Bahraich

SURGEON-GENERAL D SINCLAIR, U H S C S I completed his tour of service as Surgeon General with the Government of Madras on 11th October 1904. He was born in 1847, entered the service in October 1869, attained Brigade rank in May 1893, and was appointed Surgeon General with the Government of Madras five years ago

SURGEON-GENERAL W R BROWNE, M D, I M S is appointed in place of Surgeon General Sinclair. He was born in 1850, entered the service April 1873

LIEUTENANT-COLONEL W B BROWNING, C I E, I M S, is due back in Madras on 9th January 1905

J T W LESLIE D PRINCE A T BOWN U N MUKERJI, W L PRICE are promoted Lieutenant-Colonels I M S, from 1st October 1904

THE *Gazette of India*, 12th November 1904, gives the names of the following Medical Officers as mentioned in despatches for the Tibet Mission—Major Aldridge, R A M C, Lieutenant-Colonel L A Waddell C I F, I M S, Major C N H Wimberley, I M S, Captain T B Kelly, I M S

ON return from leave Captain A Gwyther, I M S, is posted to Durbhunga as Civil Surgeon

CAPTAIN T H DEFLANY, I M S, was transferred as Civil Surgeon to Jalpaiguri

CAPTAIN J W F RAIT, I M S, was posted to Motihari as Civil Surgeon temporarily

CAPTAIN J W L MEGAW, I M S, was placed on special duty at the Medical College, Calcutta

CAPTAIN J J URWIN, I M S, was placed on special duty at the Medical College, Calcutta.

THE Government of India have decided that when an Assistant Surgeon attached to a Company of the Army Bearer Corps is specially deputed by competent order to undertake recruiting duty connected with the corps, he will surrender his Company charge allowance, but will receive, with the pay of his rank and class, a special allowance of Rs 3 a day while absent from his charge—which will supersede the usual field allowance of Rs 30 per mensem but the period during which an Assistant Surgeon should be employed on such duty, carrying the special allowance, should in no case exceed in the aggregate four months in the financial year

The charge allowance of Rs 50 per mensem will be paid to the Assistant-Surgeon in temporary charge of the Company India Army Order No 594 of 1904 is hereby cancelled

ON return from leave Major J G Hojel, M B, I M S, is re-appointed Civil Surgeon, Ahmednagar

LIEUTENANT COLONEL W A CORKERY, I M S, is appointed Civil Surgeon of Ruttanagiri

LIEUTENANT COLONEL W H BURKE, I M S, M B, is re-appointed Surgeon to the G T Hospital, Bombay

LIEUTENANT COLONEL W G HENDERSON, F R C S I, I M S, is re-appointed Civil Surgeon of Poona

MAJOR S E PRALL, I M S, has been allowed to return to India within the period of his leave

CAPTAIN A T GAGE, I M S, officiates as Director of Botanic Survey, &c., during Major Prain's absence on leave.

CAPTAIN J W LITTLE, I M S, is appointed to the officiating medical charge of 1st Lancers

MAJOR F W GEE and Captain G E Charles, I M S, were allowed six weeks' extensions of leave on private affairs.

CAPTAIN A F W KING, I M S, is appointed sub *pro tem* Resident Surgeon, St George's Hospital, Bombay, and Professor of Materia Medica, *vice* Major J B Jamieson, I M S

MAJOR J M CRAWFORD, I M S, on return from leave is posted, as Civil Surgeon, to Gorakhpur

MAJOR J MORWOOD, I M S, is transferred from Gorakhpur to Sultanpur, U P

THE services of Captain C M Goodbody, I M S, are replaced at the disposal of Government of India

CAPTAIN A W TUKE I M S, was appointed Residency Surgeon, Baroda, in addition to his other duties from 24th October 1904

ON return from leave Lieutenant Colonel J Cummin, V C, O I E, I M S, resumed his post as Health Officer, Port of Bombay

THE services of Lieutenant-Colonel J McCloghry F R O S, I M S, are placed at the disposal of Government of India

CAPTAIN A F W KING, I M S is appointed Professor of Materia Medica, Grant Medical College, Bombay

CAPTAIN J L MAJORIBANKS, I M S, M D, D P H, is appointed to act as Deputy Sanitary Commissioner, West Registration District, Bombay

CAPTAIN K V KUKDAY, I M S, is to act as Civil Surgeon, Sholapur, till further orders

MAJOR ASHTON STREET, F R O S I M S, acts as Senior Surgeon J J Hospital, during the absence on leave of Lieutenant-Colonel W H Quicke F R O S, I M S

CAPTAIN T S NOVIS, I M S, acts as Second Surgeon, *vice* Major Ashton Smith, I M S

LIEUTENANT COLONEL R. J BAKER, I M S, is appointed Civil Surgeon of Karachi

CAPTAIN V B BENNETT, I M S, is granted combined leave for one year

MAJOR J S S LUMSDEN, I M S, is granted one year's combined leave (m c)

ON return from leave Major O H Baker, I M S, is posted as Civil Surgeon, Cawnpore

THE services of Captain C M Goodbody, I M S, are placed at the disposal of the Commander in Chief

WE are informed that the Secretary of State for War has approved of the re appointment for a further period of three years of the present civilian members of the Advisory Board for Army Medical Services—Sir O B Ball, M O, Dr J Galloway, Sir E Cooper Peiry, M D, Sir F Treves, Bart, K C V O, C B

LIEUTENANT F P CONNOR, I M S, has passed the Lower Standard Examination in Urdu

MILITARY ASSISTANT SURGEON A A ALLISON is confirmed as Civil Surgeon of Suri

CAPTAIN J DAVIDSON, I M S, on return from Tibet, is granted three months' privilege leave out of India

MAJOR McNAB, F R O S, I M S, was appointed Surgeon to the Viceroy on the return to India of H E Lord Curzon, and his place as Joint Civil Surgeon of Simla is taken by Captain Heard, I M S, recently Civil Surgeon of Ludhiana.

WITH effect from 12th October, 1904, Colonel P H Benson, M B, I M S, is confirmed as P M O, Madras District

AS we go to press the retirement of Sir Benjamin Franklin, K C I E, from the post of Director General, I M S, from 1st January 1905, is announced. It is also announced that Colonel G Bonford, C I E, will be the next Director General, I M S.

AS we go to press arrangements are being made for an I M S Dinner to be held in Calcutta, on 27th December 1904

THE new pay regulations for the Civil Department, I M S, are expected to be out very soon. They only await the approval of the Secretary of State. *Quod bonum, felix festulumque sit*

THERAPEUTIC NOTES

THE FARBENFABRIKEN BAYER COMPANY LTD send us from their Bombay office a pamphlet of clinical excerpts containing articles from various journals on the use and value of their well known therapeutic preparations. One of the most satisfactory products of their Laboratory is ASPIRIN, a substitute for the salicylates and a useful remedy in rheumatic and allied affections, it has also been found to be most effectual in cutting short attacks of Coryza. Dr Haas of Berlin writes most favourably of the same firm's CITARIN in Lithiasis and Gouty affections. Another drug HEROIN is an excellent cough allaying agent, and is decidedly preferable to codein or morphine. The reputation of this firm is a guarantee of the purity of the drugs supplied by it.

Gratifying evidence of the recognition extended to British Commercial enterprise is furnished by the honours awarded by the Committee of the St. Louis Exhibition to Messrs. Burroughs Wellcome & Co's Exhibit of 'Wellcome' Brand Chemicals, 'Tabloid' and other pharmaceutical products and 'Tabloid' Medical Equipments. Three grand prizes and three gold medals have been conferred for the scientific excellence of these products.

Messrs Burroughs Wellcome & Co, have brought out a new preparation of the active principle of the supra renal glands, under the name HEMISINE. It differs from other preparations of this active principle in being issued in a *dry Soluble* state, and is perfectly stable in all climates. Solutions can be prepared at the moment of use, this being a great advantage over ready made solutions.

The same enterprising firm have brought out DONOVAN'S "SOLUTION" in Tabloid form. This method has the great advantage of enabling the patient, for whom this well tried preparation is ordered, to carry it in his pocket and continue to take the medicine, as ordered, when employed on his ordinary business.

Messrs Burroughs Wellcome & Co have added to their list of Tabloid Stains by producing "Soloids" of the EHRLICH'S TRIPLE STAIN, it can be prepared at once by dissolving one soloid in 25 c c of distilled water.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co, Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs Thacker, Spink & Co, Calcutta.

Annual Subscriptions to the *Indian Medical Gazette*, Rs 12, including postage, in India. Rs 14, including postage abroad.

BOOKS, REPORTS, &c, RECEIVED

Report on Bombay Medical Institutions
The Madras Vaccination Report.
The Anopheles Mosquitoes of India. (Messrs Thacker, Spink & Co)
The Transvaal Burgher Camps. (Pioneer Press)
R Vincent's Nutrition of Infant (Baillière, Tindall & Cox)
Saunders's Compende (Saunders & Co)
Malignant Disease of Larynx, De Santi. (Baillière, Tindall & Cox)
Report of Egyptian Medical School.
Macnughton Jones Diseases of Women 9th Edition.
Treatment of Inoperable Cancer, Shaw Mackenzie (Baillière, Tindall & Cox)
Report of the Wellcome Laboratory, Khartoum.
Medical and Surgical Landmarks.
Report on Reformatories, Col. T E Bate, I M S.
Firminger's Manual of Gardening New Edition (Thacker, Spink & Co)

LETTERS, COMMUNICATIONS RECEIVED FROM —

Major Henry Smith, I M S, Jullundar, Capt. S. P. James, I M S, Simla, Major J R. Adie, I M S, Ferozepore. Major Maynard, I M S, Darjeeling. Capt Scott Patton, I M S, Aden. Major W Jennings, I M S, Bombay, Capt. D McCay, I M S, Calcutta, Lieut. S B Scott, I M S, Chitral, Capt. Clayton Lane, I M S, Calcutta, Lt. Col. G M Gilles, I M S (ret'd) London, Capt Rost, I M S, Rangoon, Major C. Duer, I M S, Rangoon, Major August Smith, I M S, Bareilly, Dr Lingard, Bareilly

Original Articles.

FIVE CASES OF SNAKE-BITE SUCCESS- FULLY TREATED BY THE LOCAL APPLICATION OF PERMANGA- NATE OF POTASH

COLLECTED BY LEONARD ROGERS, M.D., M.R.C.P.,
CAPTAIN, I.M.S.

Case I—By Rai R. B. Sanyal Bahadur, Superintendent of the Zoological Gardens, Calcutta—Hoosain Baksh was an expert snake man, and handled cobras very freely, but was extremely careful with Russell's vipers. He often used to extract the venom from both species. In spite of his careful handling of the reptile he was on one occasion bitten on his thumb by a small-sized Russell's viper. As soon as he was bitten he put away the snake in its box with perfect coolness, and tightly bandaged his wrist with an improvised ligature. As the accident happened while I was in the laboratory, I immediately made an incision at the site of the puncture, and applied a small quantity of crystals of permanganate of potash moistened with water. My first impulse was to inject a solution of chloride of gold, but as the solution was not ready, while the permanganate of potash was quite handy, I applied the latter. In about three-quarters of an hour, or less, the ligature at the wrist was removed by the patient himself, without any bad result following. Permanganate of potash crystals were applied in less than two minutes after the bite, and the wound kept bandaged up for nearly three or four hours.

Case II—Moona, son of Hoosain Baksh, is a most daring snake catcher. He was bitten on his forefinger while extracting poison from a cobra of great vigour and freshness. Major E. Harold Brown, I.M.S., who was at the time in the laboratory, immediately applied permanganate of potash crystals after making a free incision of the wound. No symptoms of cobra poisoning ensued. The boy, however, suffered from fever and headache for a day or two.

Case III—By Civil Assistant-Surgeon Satish Chandra Ghosh, Officiating Medical Officer, E. B. S. Railway, Chitpore—Raghunath, Hindu, male, aged 32, was bitten on the outer side of the left foot by a snake, which afterwards proved to be a cobra about 4½ feet in length, on the 7th November 1904 at about 7 P.M. Raghunath cried out that he was bitten by something, and some inmates of the house had the presence of mind to apply a stout cord just below the knee and sent for me.

On reaching the house at 7-20 P.M., I found on examination two bleeding points about half an inch apart on the external aspect of the dorsum of the left foot. The man was semi-conscious and shivering, possibly from fear, and

complained of a burning sensation over the leg and was crying out at times to be left alone. An elastic cord was tied just below the patella, the site of the punctures was incised, and dry cupping applied for about ten minutes, about 2 oz. of blood resulting. The wound was then rubbed with potassium permanganate crystals. The whole of the leg was shaved, cleaned antiseptically, and vertical incisions made down to the muscles at intervals of ½ of an inch up to just below the knee, and the leg was immersed in a concentrated potassium permanganate for nearly half an hour, after which the ligature was loosened. The patient was not allowed to sleep during the night, and no symptoms of poisoning appeared after I left, while the wounds healed nicely at the end of eight days without sloughing. The vertical incisions were made as there had been time for some of the poison to have travelled up to the site of the ligature before I saw the patient.

The fact that the man recovered and no symptoms of poisoning developed later on, affords a proof of the value of the local treatment with permanganate of potash in snake-bites, and I have no doubt that the lancet recommended by Dr. Rogers will be found invaluable in these cases if available in time. The treatment in this case was adopted after I had read his recent paper on the subject in the *Indian Medical Gazette*, to which I am much indebted.

Case IV—By Assistant-Surgeon Chuni Lal Bose, Additional Chemical Examiner, Medical College, Calcutta—Fatik, a Brahmin boy, aged about 11 years, the son of a friend of mine, was bitten by a full sized cobra at 9 P.M., on the 12th September 1901. The boy was preparing his lessons on the terrace of his house with a kerosene lamp burning near him. There were other people on the terrace who saw the snake quietly gliding near the boy, and they raised an alarm which frightened the animal, and it bit the boy on the outer side of the right knee. This snake had several times been seen in the house, but it was not killed or molested owing to a superstitious belief that an injury to a cobra living in a dwelling house would bring ill-luck to the family. The snake escaped into the crevices of an old parapet. It was seen again on the next day and was killed. It measured about five feet in length, and was found to belong to the Gokhura class.

The people had the presence of mind to immediately put two tight ligatures on the thigh above the bitten part. I saw the patient within a quarter of an hour, and took with me a lancet and some permanganate of potassium crystals, which I had with me in the house. I found the ligatures quite tight, and saw two distinct fang-marks on the outer side of the right knee-joint about half an inch apart, and there was slight oozing of blood from them. The boy complained of a burning sensation in the part and

appeared much frightened, but showed no symptoms of poisoning.

I freely applied the lancet to the bitten part, making crucial incisions which I carried a little beyond the fang-marks all round. A quantity of tarry-looking blood flowed out. I then thoroughly washed the wound with a hot solution of permanganate of potassium and bandaged it tightly up. I sent for antivenin as I thought it would give additional protection in case slight absorption of the venom takes place, but I could not get it until three hours after the bite (it was not available in any druggist's shop in the town and had to be obtained from the Superintendent of Zoological Gardens, Alipur). I injected 10 c c hypodermically and repeated it about an hour later. There were, however, no symptoms of poisoning when I injected the antivenin. I have no doubt that the injection was quite superfluous and unnecessary, the poison having been completely destroyed by the local application of the permanganate of potassium.

The wound caused by the knife and the caustic action of the permanganate of potassium took about three weeks to heal, during this period the boy had fever for a few days and complained of numbness and stiffness in the bitten limb, which gradually disappeared, and he made a good recovery. The wound was dressed antiseptically.

Case V—By Lieutenant F P Connor, F R O S—A woman was bitten in Shillong by a small snake, which has been identified by Mr Nelson Annandale, of the Indian Museum, as a *Timmeresaurus monticola*. The case was treated by incision and the local application of permanganate of potassium, and the patient made a good recovery, although some sloughing occurred in the wound.

Remarks—By Leonard Rogers, M D, I M S—The above notes have been very kindly supplied to me by the authors, and they form an instructive series in connection with the experiments I have carried out on animals at the suggestion of Sir Lauder Brunton, to test this method of treating snake-bites. It is of course possible even for a cobra to bite a person without injecting a fatal dose, but considering that the average amount obtained by D D Cunningham from freshly caught cobras averaged at least ten times a fatal amount, it is scarcely conceivable that each of the three cobras ejected less than one fatal dose in the above cases, especially as in two of them both fangs penetrated, and one patient was a small boy. It is also instructive to note that the series includes a bite by a freshly caught Russell's viper, the most deadly of the Indian viperine snakes. In the last case, although I found two years ago that the venom of the *Timmeresaurus* is of a deadly nature, and closely resembles in its physiological action that of the Russell's viper, yet these snakes are comparatively small, and probably very rarely inject a fatal dose for an adult, so

that the patient would probably have recovered in any case, but the amount of damage to the tissues produced by the poison was very likely lessened materially by its local destruction by the treatment applied. In connection with a statement in a recent article in the *Times* that "it would be vain to count on any immediate results from an instrument, which, to be effectual, must be used promptly, for the Indians are not prompt," it is of interest to note that in each of the two cases in which the bites occurred in native households an efficient ligature was at once applied and a neighbouring medical man instantly sent for, for these cases afford good ground for hoping that when Sir Lauder Brunton's simple and efficient snake lancet gets widely known and distributed in India, many lives may be saved, which would otherwise be lost.

NOTE ON THE PRESENCE OF SPIRILLA IN A TROPICAL ULCER

BY W S PATTON, M B, Ch B (Edin),

LIEUT I M S,

Aden

In the September number of the Royal Army Medical *Journal* there was a note of a case of ulcer with spirilla by Major Smith, R A M C.

I would like to add some notes of a case which came under my observation last August while in Aden in charge of Native Military General Hospital. The patient was an Arab beggar who came round to the hospital for food, he had a large ulcer about three and half inches broad on the lower third of his left leg, the ulcer was discharging pus profusely, the leg was much swollen and indurated, on asking the man a few questions it was found that he had just recovered from a fever which lasted four weeks.

The ulcer, he said, was not caused by an injury, but came itself towards the latter part of his illness without any apparent cause. His spleen was enlarged as far as umbilicus, and his liver one inch below the costal margin, he was much emaciated and had a considerable discharge of pus from his gums.

Just at this time I had a case of spirillosis under my care in the hospital who was now convalescent, I had noted that this man had had two ulcers on his right leg which he said came during a previous attack of fever, this man also had Pyorrhoea Alveolaris. This led me to take a squash film from granulation of the ulcer. One film was stained by Leishman and the other with carbol fuchsin. Both showed large number of spirilla beautifully stained, no Leishman-Donovan bodies were found.

Blood films were also taken and stained by Leishman, but no malarial parasites or spirilla were found.

Comparing the spirilla from the cases of relapsing fever with those from the ulcer, no difference could be made out.

Films of pus from the gums showed *Spirilla buccæ* and bacillus fusiformis of Vincent, these spirilla were also indistinguishable from the two spirilla mentioned above. The pus from the gums of the case of relapsing fever showed during the whole of the periods of pyrexia and apyrexia the two organisms of Vincent.

Had the present case then suffered from relapsing fever? It seems most probable that he had, question then is what is the relation between these spirilla. It is to be regretted that neither *Spirillum buccæ* or bacillus fusiformis have yet been cultivated, both of them are actively motile and, as Dr A. E. Wright has recently pointed out in the *Lancet* that bacillus fusiformis is very like a trypanosome. Professor Schaudinn has recently found that the spirochæte obermeyer of relapsing fever is but a phase in the life history of a trypanosome, that it has a large nucleus and micro-nucleus and, further, that it also alters its shape contracting so as to present a form of a minute oval or pear-shaped body provided with a large and smaller nucleus.

I regret I was unable to further study this interesting case as the man left the hospital during the night and could not be found again.

There is yet good deal of research to be done on human spirillosis. I believe spirilla have been found in an abscess, but I am unable to say by whom. I trust these few notes may stimulate further research in this direction.

PLAGUE, RATS, AND FLEAS *

By W. G. LISTON,

CAPTAIN, I.M.S.

(Read before the Bombay Natural History Society, on 24th November, 1904.)

You may perhaps think that the choice of such a title for a paper to be read before a Natural History Society is somewhat out of place, and would have been more suitable for a medical gathering. Perhaps you are right, but I feel sure that the subject has a proper place under the circumstances. We are daily becoming more aware of the important part played in the spread of disease by the numerous animals and insects which surround us, and, as you will learn in the course of my remarks, plague is a disease which is pre-eminently dependent on such surroundings. A knowledge of Natural History is becoming a more important, I may say an all important branch of the medical profession. Quite apart, however from such facts, plague is in the midst of us, carrying on its deadly ravages, and adding daily to its already uncountable death roll hundreds, who, through ignorance of its mode of spread, fall victims to the scourge. Any ray of light shed into the darkness which surrounds the ætiology of this disease should not be confined to the medical world, but be cast upon the people, that they may perhaps be enabled thereby to grope their ways through the darkness to a place of safety.

You will appreciate the relation between Natural History and Plague when I define the latter as a rat

disease. Not unfrequently under favouring circumstances it is communicable to man. The disease among men, therefore, might almost be said to be accidental, and certainly avoidable if there were a distance between rats and men. The communication of the disease to man is conditional on the propinquity or distance of rats and men from one another, and is dependent partly on the habits of the former, and partly on the modes of living of the latter.

The ideas embodied in the above definition are not new. That plague is essentially a rat disease was known to the ancients. We find the disease attributed to these animals by the priests and diviners of the Philistines, who instructed the people in these words—"Make images of your emerods and images of your mice that mar the land." They were to do so as a trespass offering to the God of Israel. In the Bhagavathi Purana the people are advised "at the moment rats fall from the roof above, jump about, and die" to leave their homes with their friends and relations, and to live in the plain. In Kumaun, where the disease has been known for long, the experience of the inhabitants has taught them that when rats die, it is time to quit their homes for the jungle to save themselves from plague. It is stated in a report of the outbreak of 1834-35, that "the appearance of the disease in a village had been observed to be preceded by a mortality among the rats of the village." Coming to more recent times, Hankin, in reviewing the various circumstances that produced plague in Bombay inferred that the incidence of plague in localities and houses was in relation to their accessibility to rats rather than to filth, overcrowding, etc. Simond also came to a similar conclusion from his experience of the disease.

Dr Ashburton Thompson, from his experience of the outbreak of plague in Sydney in 1900, formed the opinion that plague rats constituted the sole source from which the infection was communicated to man. Dr G. J. Blackmore, formerly Chief Plague Medical Officer, Port Elizabeth, very clearly and conclusively proved that the epidemic in that town was altogether spread by rats. He writes "To sum up shortly, in places where infected rats were found plague cases followed, and in places where there were no infected rats, only four cases of plague occurred, and in these cases the source of infection could not be traced at all. In no case was there direct evidence of man to man infection, and in most cases the possibility of it was definitely excluded." I need not quote further in this connection. It is absolutely certain that rats are the most important factor in the spread of plague. If plague is a disease of rats, then it is likely that the disease may have its own distinct laws of origination and continuance among these animals, man becoming affected chiefly when the disease is most prevalent among rats. It is precisely this study of plague among rats that has been neglected. Before any progress in this connection can be made, it is necessary to know something about the life and habits of rats.

What do we really know about rats? Very little. Now this is one reason why I am reading this paper before you to day. You are all naturalists, and no doubt keen observers. May I ask you to direct your attention to rats? Any notes upon the habits of these animals will be thankfully received by me.

Let me here discuss some of the important facts connected with the habits of rats, which have a bearing on the development and spread of plague, so far as they are known to me. In the first place, as you are aware, there are various genera and species of rats. I have tried to classify (more or less casually I must admit) the Indian town or village rats, but I have completely failed. There appear at first sight to be many species. I visited the British Museum when at home, and saw Mr. Oldfield Thomas on this subject, and he assured me that any rat I sent from Bombay would be likely to be either a *Mus rattus* or *Mus decumanus*. I was discussing this matter the other day with a member of this society, Mr. Aitken, and he suggested that it might

* Revised copy sent for publication.—Ed., I.M.G.]

be as easy to classify the dogs as the rats in Bombay. I am inclined to agree with him. There is apparently one fact evident that Mr Oldfield Thomas is quite right in distinguishing only two *very distinct* species of domestic rat—*Mus decumanus* and *Mus rattus*.

Mus decumanus, the brown rat, or Norway rat, is a large rat which in European countries has gradually displaced the smaller black rat, *Mus rattus*. This brown rat is much more a burrowing rodent than the black rat, and likes to live in drains and cellars, while the black rat prefers the roofs of houses, and even trees to live in. The black rat, then, is in a truer sense a domestic rat, and it is the common domestic rat of India. This fact is an extremely important one from the point of view of plague. The immunity of European countries in the present day can to a large extent be attributed to the ousting of the black rat by the brown rat. The changes in the habits of man in European countries within the last two or three centuries, the development of drainage systems, the separation of workshops from dwelling houses, the isolation of granaries and stables from human habitations, has led to the extermination of the black rat or at least to its separation from man. The opportunities for the infection of man with plague from rats have thereby been lessened, and consequently in Europe the development of plague in rats runs almost independently of the development of the disease in man. No more striking instance of this can be given than the experience of Glasgow. Plague first broke among the people of this city in the autumn of 1900, thirty-six attacks with sixteen deaths was the result of this epidemic. The origin of the disease could not be traced. All the cases were more or less associated with one another, and arose chiefly from three houses in which "wakes" were held over the bodies of individuals who had died of plague in the houses. At the time of this epidemic no rats were found affected with plague. There is good reason to believe, however, that although not found, yet the epizootic actually existed, for, after an interval of a year, a second outbreak occurred, this time among individuals associated with a rag store. Rats affected with plague were found here, and continued to be found affected with the disease in various parts of the city, at irregular intervals, for a period of two years. The only epidemic plague associated with this epizootic plague was that which occurred in some five individuals who worked in the rag store, and in other five individuals who worked or lived in the cellars of the Central Hotel. Plague infected rats were found in the basement of certain tea rooms in Gordon Street. A rat warren was discovered, which, when the burrows were broken up, gave a bag of 67 rats which had either been killed or found dead. Of these 67 rats no less than 40 had plague. Rats affected with the disease were found in other places, and continued to be found, as I have remarked, for nearly two years, but no plague occurred in men. It is evident we were here dealing with epizootic plague among rats of the species *Mus decumanus*. You note the diseased animals were found in cellars and burrows, places where rats of the species *Mus decumanus* are generally found, places where they were more or less isolated from man. Had the epizootic occurred among rats of the species *Mus rattus*, which inhabit houses, a very different tale would have been told. It is interesting to note the gradual disappearance of plague from Europe about the end of the 17th century, a time which was coincident with the invasion of the brown rat, and the displacement of the black rat by that species. The species of rats affected by the disease has an important bearing on the spread of plague in man, not from any inherent difference in susceptibility to the disease in the particular species of rat, but because of the habits of the species. Another important difference will be noticed when I came to describe the fleas infesting these species of rats.

Now while there is the striking difference in the habits of the two species of rats, we have equally striking

differences in the habits of the people inhabiting Europe and the East. I have referred to the fact that perhaps the invasion of Europe by the brown rat may have been aided by the change in the habits of the people. As macca buildings became to be erected, as drainage systems developed, as stables were separated from dwelling houses, as shops, warehouses, and granaries were no longer used as human habitations, as stone and wooden floors displaced mud and rush covered ground, as beds became used in place of heaps of straw, so the black rat was driven from its haunts and the brown rat had it all his own way. Man and rats were separated from one another, and plague ceased to trouble, for, as will be shown later, man plays an important part in spreading the disease among rats.

An observant correspondent, the Revd J H Lord, who is much interested in the origin and spread of plague, very briefly put it as follows—

"What a timid and scared animal a rat is at home, living away in sewers or barns or hay stacks, as a rule only occasionally venturing among men. But here, in India, on the contrary, it is a confiding, almost domestic animal, encouraged to impudence by the very aversion of Hindus to the destruction of animal life, while on the other hand, modes of human life out here cause masses of people to live huddled together, in what are almost barns and warehouses, in closest contact with rats, and throughout the East it is more or less so, and I would even suggest that the plague has been able to catch on at various places more or less according as conditions are similar or dissimilar to what I have described, *eg*, at Alexandria, the Cape, Lisbon, Glasgow, etc, and also, when the plague in the Great Plague of London did catch on there, was it not perhaps because people were living a good deal in the insanitary way, then, as to overcrowding and contact with rats, etc, that they do in the East now?"

So much for the difference between the two species of rats, the habits of each species, and the habits of man, which bring men and rats more or less in contact with one another.

Rats, like men, are gregarious creatures, they have their communities in each town or village, communities which have little or no intercourse with one another. They have their maharwaras and bunispuras, some live upon the refuse of the people, others install themselves in the granaries of the rich, little communication, as I have said, takes place between these communities, but still less communication can there be between the rats of one town and those of another except through human agency. Our high sea-ways, railways, and cart roads, all of them channels for the conveyance of merchandise, act also as a means of communication between the rats of one town with those of another, stray individuals are carried along with merchandise, stowaways, as they might be called, are taken from one town to another. This is only a chance means of communication between rats of one place and those of another, and the chances are of course greater where the means of conveyance is larger. Ships transport rats therefore in this way much more frequently than railway trains, and railway trains more frequently than carts.

Another habit of rats must here be considered, a habit too, in which they resemble uneducated men. On the occurrence of any unusual mortality, from any cause, among a community of rats, they quit the place where the mortality has occurred, they migrate as a community. In this way infection is often communicated from one community of rats in a village or town to another in the same village or town. Here a fresh focus of infection may, in consequence, be set up. Occasionally some individuals of such a migrating community may seek refuge in a ship or railway train or cart and may carry this infection through human agency to another town. This is one important way in which plague may be spread from one place to another by human agency. Seaport towns, as will be under

stood from what has been said above, are most frequently infected in this way. I would instance Sydney, Port Elizabeth, Durban, Lisbon, Glasgow, etc.

But there is another means of communicating the disease by means of human agency from rats of one town to those of another town, which will be discussed later when the part played by fleas in the spread of the disease is considered. I mention this fact here because it becomes possible only in connection with the migrating tendency of rats. I need hardly discuss at length this migrating instinct (shall I call it?) which impels rats to shun places which are associated with their death or destruction. Who has not set a trap for rats and found, that after two or three have been taken, the rats will not look near the trap again? Who has not noticed, that if a good dog or cat is introduced upon rat-infected premises, after a few of the animals have been destroyed, the others disappear? Who has not noticed, that poison placed for rats will cause the disappearance of far larger numbers of them than are actually destroyed by the poison? This habit of migration, due to fear of destruction, is a very important habit of rats in the spread of plague. I should like, however, to emphasize the fact that the extent of the migration is proportionate to the severity of the destruction. Thus, if a trap is set, say, in one room which is frequented by rats they will probably quit that room for a neighbouring room. But if a wholesale destruction is produced as by placing poison in several places in a house, the rats will quit the house completely. Just so is it with plague. If conditions are such as are unfavourable to the rapid spread of the disease, the infected rats may linger on in a particular house, not being so thoroughly scared by the moderate mortality as to quit the house, infection may thus smoulder on in a particular house till the conditions become favourable to the extensive spread of the disease. I shall now consider what these favourable conditions are. They are associated with the breeding season of rats, and are due to the increase in the number of susceptible individuals and the multiplication of fleas, the carriers of infection.

The season at which the greatest number of young rats are present has a two fold influence on the spread of plague. In the first place, the arrival of young members among the community increases the number of individuals susceptible to the disease.

In the second place, the breeding season is, as a rule, the period of increase of the fleas which are peculiar to the rat. You must be familiar with the fact that kittens and puppies are especially covered with fleas. If you wish to get a particular flea which has a certain bird for its host, your best chance of obtaining that species of flea is to find the bird's nest. So precisely is it with the rats. Rat fleas are most numerous at the time when young rats are most numerous. I fancy I hear somebody say "Oh! rats breed all the year round, they have no seasonal breeding time." This is true and it is not true. Rats do often breed all the year round, but I am equally certain that there is a season when more young rats are found than at any other season, and this season, in Bombay, is precisely the plague season. This is a very difficult matter to prove, and I should be very much obliged if any member could devise a practical method by which it could be proved. My inference has been made from observing the number of young rats brought to the Laboratory at certain seasons, and by noting the number of pregnant females which come for *post mortem* examination. I am sorry, however, that I have no figures to offer wherewith to support by observation.

An epizootic of plague among a rat community is very often associated with a sudden and extensive spread of the disease, in proportion as there are more susceptible individuals present in that community, so the disease spreads more rapidly and extensively. A large number of the rats die from the disease, the rats become scared and migrate. The conditions in such a

migrated rat community now are (1) there are a number of individuals which have recovered from the disease, and are therefore immune, (2) there is a greatly reduced number of individuals susceptible to the disease, because of the large number of deaths among the susceptible, (3) there are a few individuals which still harbour the disease and which have escaped with the others, (4) there is a greatly reduced number of fleas among the community, the infected fleas having for the most part been left behind. These are conditions where the chances of infection are greatly reduced, where it is possible for one case to follow another only in slow succession, where the panic of the rats, by the reduction of the mortality, has been quelled. Time passes, the disease smoulders, gradually the rats return to their old haunts, where above all other places they find food and shelter. The favourable breeding season comes round again, the number of susceptible individuals rapidly increases, and the number of fleas *pari passu* is multiplied. Conditions are re established for a fresh and extensive outburst of the disease. Numbers of rats die from the disease. Again the rats migrate, and plague attacks man. It is thus that I would explain the seasonal endemicity of plague.

In the above remarks I have endeavoured to show the importance attaching to the particular species of rat inhabiting any place which may be subjected to plague infection. The black rat, *Mus rattus*, the common domestic rat of India, of which there are probably very many varieties, has habits such as bring it into intimate contact with man. I have tried to show that the prevalence of this rat is in great part due to the habits of men in the places where it is found, that it is possible by abolishing certain habits and customs to give the ascendancy to quite a different species of rat, which is not so domestic as the Indian rat. In short, plague is likely to spread among men in proportion as *Mus rattus* is more common, and *Mus decumanus* less prevalent, in proportion, too, as men's habits are less or more civilised. I have drawn attention to the gregarious habits of rats, which would speedily end an epizootic of plague among them, were it not for their habit of migration, which causes infection of fresh communities in the same town or village by direct intercourse, and in distant towns, through human agency, chiefly by ships or rail conveying merchandise. I have suggested that infection of rats in neighbouring towns and villages is affected by means of fleas carried by men. Finally, the breeding season of rats plays an important part in the spread of plague in man. Plague, which is essentially a rat disease, attacks men only when it is excessively prevalent among rats. The disease lingers on in these animals during the off plague season, and bursts out afresh among the rats when the number of susceptible rats is increased by births, and when the fleas, the carriers and transmitters of the infection, are more plentiful.

If plague, then, is essentially a disease of rats, are there any other diseases which are peculiar to animals, and which are occasionally communicated to man? Does a study of these diseases furnish us with any evidence which may explain by analogy how plague is, or is not, or cannot be communicated to man? How is plague communicated from rats to men?

The following are epizootic diseases which are occasionally communicated to man, and I would class plague along with them, namely, Anthrax, Glanders and Hydrophobia.

[Popular description of these three diseases omitted —Ed, I M G]

Now, the plague germ does not bear spores, hence it cannot remain alive for a long period exposed to air and light and other adverse agencies, in the way the anthrax bacillus does. Nor yet has the plague germ any resistant cell-wall. Plague is certainly not conveyed to men by direct inoculation as hydrophobia is. How then can we explain the infection of men from the rat?

A little further thought on the methods of reproducing plants adopted by the *malis* will enable us perhaps to solve the problem. Has he any other method of making cuttings? Of course, there is the method of making a gooty. He selects a certain part of the plant, and ties around it some moss and earth which he keeps constantly moist. Many plants which could only be propagated by means of cuttings with difficulty, can thus easily be reproduced. Have we anything analogous to the gooty in the case of plague? I believe the flea is the gooty. The plague germs which abundantly circulate in the blood in the final stage of the disease are taken up along with the blood by the flea. I show you a specimen under the microscope which is a section through the stomach of a flea. This flea was fed on a plague sick rat, and allowed to digest its meal for 48 hours. The result is, that almost all the blood has been digested and absorbed, and the plague germs remain unaffected, in fact, they appear to have multiplied, because they are far more numerous, than they could have been when ingested with the blood, and their appearance would indicate multiplication to one who is acquainted with bacilli which have been stained under such circumstances.

In the flea's stomach we find the plague germ in surroundings which will daily supply it with the very pabulum it desires, animal blood. The germ is not destroyed by the digestive juices of the flea. It is protected from light and dessication and the presence of contaminating bacteria (weeds in other words), conditions which would have put an end to its existence if it had remained exposed on earth. We have all the conditions which are fulfilled by the gooty in the case of the plant. The gardener after a certain time cuts off the new plant below the gooty, and transfers it to its natural soil. So, too, the germ within the flea has now to be transferred to more suitable soil, the animal body, and this is accomplished by the bite of the flea itself. The flea, being animate, fulfils the double function of gooty and *malis*.

And now, to understand the last part of my subject, it is necessary to say a few words about fleas. It would be possible to write pages on the subject. My difficulty is to tell you enough in a short space, to fully explain the relation between fleas and the plague. I hope therefore you will bear with me if I detain you a few moments longer. There are four species of fleas met with in this country commonly associated with men and rats. Specimens of these are displayed under the microscopes. I can only now mention them by name, and detail a few of the habits of these species.

The most common flea and the one most universally distributed is the cat flea, *Pulex felis*, sometimes also called *Pulex serraticeps*. This flea is, for the most part, found on cats and dogs, but it is frequently taken on man too. I have also found it on rats, monkeys, sheep, deer, goats, guinea-pigs, the hedge hog and the horse. It is a rather small flea, but variable in size, and is of a dark colour. It is frequently found in light airy places, and it is not so nocturnal in its habits as the other fleas. Then, there is the human flea, *Pulex irritans*. It is a large fairly light-coloured flea, found almost exclusively in human habitations, and in only those of them which are dark and more or less dirty. I come now to rat fleas. The common flea found on *Mus rattus* is *Pulex cheopis*. It is therefore the common rat flea of India. It is a small light-coloured flea, which is particularly sensitive to light, loving the dark, and is therefore more or less nocturnal in habit. It is seldom found apart from the rat in this country, and lives chiefly in the haunts of the black rat, among grain bags and in the roofs of houses, etc. At first sight it is very like the human flea. The flea commonly found on *Mus decumanus* is called *Ceratophyllus fasciatus*. In so far as *Mus decumanus* is rare in this country, this flea is also seldom found in India, but it is the common flea of Europe found on the rat.

These fleas can be distinguished from one another in both sexes by noting if there is a comb of bristles behind the head. *Pulex felis* and *Ceratophyllus fasciatus* have both got combs in this situation. *Pulex felis* has in addition a set of teeth-like bristles surrounding its mouth, *Ceratophyllus fasciatus* has not got these bristles. *Pulex irritans* and *Pulex cheopis* have no comb of bristles behind their head. They are readily distinguished by the length of the anti pygideal bristles, which are short in the human flea and long in the rat flea. The claws of the human flea, too, are very large and scythe like, while the rat flea has more elegant scythe shaped prehensile organs. The males of all four species are at once distinguished by the characteristic shape of the claspers.

Now you will notice that most of these fleas have a particular host. The cat flea, however, is more or less an exception to this rule, for it is often found on other hosts than cat or dog. If this is the case how is it possible to explain the infection of man from the rat, when, under ordinary circumstances, the human flea is only found on man, and the rat flea on the rat? This fact, more than any other, I think, has prevented men from accepting the flea theory of the spread of plague, for not a few instances have now been reported in which plague has been directly communicated from the diseased rat to the healthy rat by means of fleas. But, it is objected, how can men become infected if the rat flea is never found on man? I have had the good fortune to discover an explanation of how the rat flea can communicate the disease to man, although normally the rat flea, *Pulex cheopis*, is scarcely ever found on man.

In March 1903 some guinea-pigs, which had died in the Victoria Gardens, were sent to me for examination. I found that they had died of plague. I immediately visited the gardens to see if I could find any fleas on the guinea pigs, to my surprise they were covered with fleas. An examination of these fleas showed that they were rat fleas, *Pulex cheopis*. The following history of the disease was given to me by the Superintendent. A few days before the guinea pigs became ill, dead rats had been found near their cage. The guinea pigs had then sickened, and two keepers who had charge of them took plague and were sent to hospital. One or two of the guinea pigs had died before the dead animals were sent to me for examination. When I saw the guinea-pigs in the gardens many were sick, but some appeared healthy. It was interesting to note that the sickly were those most infected with fleas. From one sick guinea pig no less than eighteen fleas were removed. This is an important fact to note, in that, thereby the number of infected fleas will be greatly increased. An examination of a large number of guinea pigs kept in our Laboratory stock showed that these animals seldom harbour fleas, the only flea found on them under normal conditions is a very occasional *Pulex felis*. This unusual infection of the guinea pig by *Pulex cheopis* remained for some time a mystery, but an explanation was gradually forthcoming. Here, no doubt, infected rat fleas had communicated the disease to the guinea pigs, but why were rat fleas found on guinea pigs? The problem was solved in the following way. A friend who lived in two semi detached bungalows kept a cat. One of the bungalows was used as a nursery for the children, and the nursery was the favourite haunt of the cat. When the hot weather came on the children were sent to the hills, the nursery was shut up and the cat had to find other quarters. About a month later my friend had to re open and enter the nursery to get some things for the children. No sooner had he entered than he was bitten by a flea, and then by another and another, and to his surprise he found many fleas on his legs. He caught these fleas and brought them to me, and when I examined them I found them to be cat fleas. Now, as long as the cat lived in the nursery, fleas never troubled the inmates, but when the cat had been excluded, the cat fleas swarmed onto man. Starvation apparently had driven them to man.

Another opportunity presented itself in the case of a stable. This stable had been shut up for some weeks, but had formerly been inhabited by a dog as well as a horse. When the door of the stable was opened, fleas literally swarmed out into the man who opened it, almost as a hive of bees might do when disturbed. One had only to approach the stable door, and immediately one's trousers were covered with fleas. These fleas were *Pulex felis*, which we saw was the common dog flea. Here again driven by hunger, in the absence of the dog man was attacked. Herein lies, too, the explanation of the swarms of fleas one reads and hears of in dāk bungalows in India. Somebody has been there before with dogs. The dogs left with their master, but left their fleas behind. The bungalow was shut up for a time, another Sahib entered, this time without a dog. He is immediately attacked by the fleas.

Finally, the proof was completed by the following experience for which I am indebted to the Revd J. H. Lord. On April 20th last year he sent me some fleas which had been caught on man in a house which was infected with plague under the following circumstances. About the 6th or 7th of April rats began to die in large numbers in the chawl in which this house was situated. Suddenly the deaths amongst rats ceased, and on April 11th the people became troubled with fleas. The fleas were so numerous that they had to quit their rooms and sleep out in the verandah. While living in the verandah on April 17th one of the inhabitants of the particular room in which the fleas were taken became infected with plague. Another case occurred on the same day in a room adjoining. This room was separated from the aforementioned room only by partition $8\frac{1}{2}$ ft. high. On the same day the information about this chawl came to Mr. Lord. He succeeded in getting the people who inhabited the room where the above case occurred to collect some of the fleas which they said troubled them, and he sent the collection to me on April 20th. An examination of this collection was most instructive. Now I must tell you that on previous occasions, of 246 fleas which were caught on man under normal conditions I had only found one rat flea (*Pulex cheopis*). But of the collection of 30 fleas caught on man under the circumstances above recorded no less than 14 of these were rat fleas. Nothing could be more striking.

Now what is the explanation of such unusual invasion of the guinea pig and man by rat fleas? You note, that in both cases a few days before, rats had been noticed dead in considerable numbers, then no more rats were found dead, and plague broke out in the guinea pigs and men. Taking this in conjunction with the facts above recorded regarding the starved fleas, I think the explanation is that, either the rats had been almost completely exterminated by the plague, or what is more probable on the occurrence of a large number of deaths, they had migrated. In consequence the fleas which they left behind them in their nests and haunts had to seek food somewhere else, and under these circumstances had attacked the guinea pigs and men. Herein I think we have the explanation of the common phenomenon (1) plague among rats with many deaths, (2) a lull, (3) then plague among men. Since these cases occurred I have been on the look out for fresh opportunities, but you will readily understand that information of this sort is difficult to be obtained by one individual. Will you help me to examine such cases? When you hear of any unusual number of deaths among rats from plague, please let me know at once, and if we are unable to persuade the people to catch the fleas on their persons, I propose to use guinea-pigs to trap the fleas by placing these animals in the probably infected rooms, and then we shall be able to see whether rat fleas are straying about, for they will take to the guinea pigs and can easily be captured on these animals.

If rats can communicate the disease to man, it is equally certain that man can carry the disease to rats. I have already explained how the disease can be communi-

cated to distant towns and villages from infected rats in one place to those in the other place by human agency. But there are other well recognised cases where infection has been carried from one village to a neighbouring village by man, where the possibility of the direct transference of infective rats from the one place to the other is absolutely excluded. The record of such cases is almost legion. I take 2 cases of 12 recorded in the excellent report on plague and inoculation operations in the Amritsar district in 1903, by Captain S. Browning Smith, I.M.S.

Kadgil—(The name of the village.) Here the disease was brought from Thau, by Buta, a weaver, in November 1902. He died after three days' illness, and three other deaths occurred in this house within five days, rats died in this house, and were allowed to remain, and the house was locked up, plague did not spread at the time, and no other case occurred for two months, when dead rats were noticed in some sweepers' houses that adjoined Buta's house, seven days after dead rats were seen, the disease appeared among the sweepers.

Phailoke—The disease was brought from Chela, Lahore District, by Chet Singh, who returned to Phailoke on the 25th March 1903. Rats began to die on the 29th March 1903. Chet Singh fell ill on the 2nd April, and died on the 8th April. Three other cases occurred in the same house.

Captain Browning Smith remarks "The above is a case where it seems that infection was brought in the clothes of the man, rats were infected from this, and the man himself was infected from the rats." The cases speak for themselves. The explanation I offer is that a man living in an infected village takes fright when he finds cases of plague occurring among others in his own house. The infection of this household was clearly brought about in the way I have described above, rats died, the remaining ones migrated, the hungry infected fleas they left behind attacked man; man became infected, some of these fleas having got among the clothes of the fugitive man, he has carried them to the village to which he has fled. The fleas may have in the meantime attacked him, and if so, he dies of the disease shortly after his arrival, but possibly the fleas may have failed to get through his clothes, the man then remains unaffected. When transferred to the new village in this manner, the fleas find themselves in fresh rat-infested premises, and are not long in scenting out their natural host, the rat. They infect the rats, the disease spreads among the rats rapidly, they die, the rest take fright and migrate, man becomes infected.

But why press this flea theory, you will say, when we know perfectly well that the excreta from infected animals is capable of infecting fresh animals. This is a gratuitous assumption. Have you tried it? I have. Healthy rats can live in the same cage with infected rats without acquiring the disease, if only fleas are excluded. I told you of such experiments when I read a paper before you in March last year. Since then other persons have independently confirmed my observations, particularly Dr. Klein.⁹ I have been able to prove that although susceptible animals do take plague through the alimentary canal if fed on large quantities of grossly contaminated food, yet they can eat food, which has been contaminated by a relatively small quantity of plague without harm. Moreover, what is more important, they are not infected with the insufficiently large quantity of plague which is contained in the various excreta of plague-infected man or animals. I have fed rats on such excreta, and kept them in contact in a small cage with clothing which had been soiled by dying plague patients, and they have not suffered from the disease. But when even one or two germs are introduced by a needle under the skin, death almost always results. Thus, a guinea pig has died of plague after receiving one quarter of a c.c. (about 4 drops) of a ten million-fold dilution of a 48 hours broth culture of plague. In this quantity I was able to show

there were not more than one or two germs. If only one or two germs are necessary to infect an animal by injection under the skin, while millions are necessary by any other channel which is more likely to be the common method of infection?

Simond¹⁰ long ago showed that phlyctenules (blisters occasionally found in cases of plague, and which reveal the point of inoculation of the bacillus) often occur in parts little liable to abrasion (such abrasions might permit the plague germs to enter the blood) but which are frequently attacked by fleas. If cuts and abrasions were the chief source of infection phlyctenules would be commonly found on the soles of the feet of those who go about bare footed, but this is not the case. Phlyctenules in this situation are extremely rare, while they are most common just in the situations which are most subject to be attacked by fleas. Again the boot wearing people of Australia suffered as frequently from buboes in the groin as the bare-footed Natives of Bombay. 73 per cent in the one case, 67 in the other.¹¹ If the bacillus lived in the soil it would have been reasonable to expect a larger number of groin buboes in the bare-footed Natives than in the booted Australians. Moreover, the common sources of infection with plague are dark dirty over crowded vermin infested houses, also clothing and grain. It is just in these surroundings that fleas may be found. We know, too, that houses and clothing can be indirectly infective through the medium of a healthy uninfected individual. The healthy individual carries with him something, presumably infected fleas, to another individual who sickens with the disease.

The seasonal prevalence of plague can to my mind be most easily accounted for by the greater prevalence at some given time of some intermediary host of the plague bacillus after the same manner as the prevalence of malaria is associated with the prevalence at certain definite seasons of certain species of mosquitoes of the genus *Anopheles*. On several occasions fleas have been noted to be specially abundant prior to or during the course of an epidemic of plague. I will only mention two instances. Thus, for example, Dr Tidswell's attention was directed early in the epidemic of plague in Sydney in 1900 to the unusual prevalence of fleas in the infected quarters. He writes "At the time the rats were diving in large numbers upon the wharf, to which attention was called above, the fleas there were so numerous that the labourers tied string round the bottom of their trousers to protect themselves against the onslaughts of the vermin."¹² Again, in connection with the rat epidemic of plague at Cardiff in February 1901, I quote from the Local Government Board Report for 1902 "Fleas in considerable numbers were observed on the white flour sacks in the warehouse mentioned."¹³ I have on more than one occasion been told that before an outbreak of plague occurred fleas were noticed to be very prevalent, the only wonder is, as Tidswell¹⁴ has expressed it, that such a fact should have been noticed at all, for the social status and domestic habits of most people among whom plague occurs is not such as to invest a little incident of this sort with remarkable novelty. Finally, there are many facts to my mind which cannot be explained on any other hypothesis, I will only mention a few of them here.

Mr Nigel Paton, who is in charge of a large oil store in Bombay, wrote to me after reading my paper published in the Medical and Physical Society's Transactions last year,¹⁵ that he had been at a loss to explain why every year during the plague epidemic he lost several hands employed by him in the office connected with the store, while, since the plague has broken out in Bombay he did not remember a single death from plague having occurred among the hands he employed in the store itself, although the hands employed in both departments lived in much the same manner, and in the same infected surroundings. Unfortunately he could not support the statement by statistics, but he said it was a well-known fact in the office, and had annually been

commented on. His explanation of the fact now is this that men in the oil store itself were constantly handling oil, to such an extent indeed, that their bodies were covered with it, and he presumed that probably the smell of the oil, or some other cause connected with the oil, prevented the infected fleas biting the oil workers, and so they escaped the disease. Now Mr Paton's experience is by no means unique. In 1797, it was observed by Mr Baldwin, the British Consul in Egypt, that among the millions of inhabitants who died of plague in that country in the space of four years, not a single oilman or dealer in oil had suffered.¹⁶ Sir J. McGregor remembered that all the men employed in applying oil to the camels' feet during the Egyptian campaign, escaped the plague.¹⁷ Mr Jackson states that the coolies employed in the oil stores of Tunis smear themselves with oil, and are rarely affected with plague when it rages in that city.¹⁸ It is also stated by Luigi Pavia that during the 27 years he was attendant at the pest house in Smyrna he found friction with oil more efficacious than any other medicine both as a prophylactic and as a means of cure.¹⁹ In the plague epidemic in India in 1816 and 1819 Mr White talking of the common practice in the many parts of India of friction to the body with oil says "This (practice) has upon very good authority and extensive experience, been supposed a complete preventive, as well as a powerful agent in the cure of plague."²⁰ "Mr McAdam says 'Another remark which the Natives make, and which I think is likely to be just, as they are not apt to take notice of anything that is not extremely obvious, is, that those engaged in the expression of oil are not liable to infection.'²¹ Can the relative immunity of Calcutta and Madras compared with Bombay and the Punjab be due to the habit of daily anointing the body with oil in the former to presidencies? I was very much struck by this habit in Sambalpur, where recently I was Civil Surgeon, the people in this district follow partly the habits of the people of Calcutta and partly those of Madras.

I was informed that the Jubbulpore Municipality placed it on record during a very severe epidemic two years ago that tobaccoists who lived in their shops were peculiarly exempt from the disease.

It is notorious how frequently visits at night to plague infected houses have been followed by fatal results, while the same houses could be entered with impunity by day. In this connection the following quotation from the report of Dr Watson on the Mahamari (plague) of Kumaon is of interest "The experience of Dr Renny, Dr Pearson, Dr Francis and others has proved that a medical officer can without danger feel the pulse of a plague patient and give him medicine, and also that medical officers can without danger examine by dissection the body of a man who has died of plague." That is to say, he can do these things by day, with the sun shining and the air tolerably warm. I do not believe he could do any of them with immunity after night fall. Take these facts in conjunction with the observations I have made that *Pulex cheopis* shuns the light, and the facts which I communicated to you in the paper which I read before you last year. I then told you that I had noticed that on certain days I was able to get many fleas from the rats sent to the Laboratory, while on other days none were obtained. As many as 53 rats on one day were examined and not a single flea was obtained, while on another day 13 rats yielded 22 fleas. In seeking for an explanation for this I noticed that when the rats were brought to the Laboratory in a dark iron cage, fleas were plentifully found on the rats, while when they were brought in an open wire cage no fleas were found on them. I also noticed that if the rats were kept in open cages in a light place all the fleas that were placed on them disappeared.

It would be possible thus to greatly enlarge upon this subject, but already I have occupied you far beyond the usual time devoted to a paper. I had sketched out in my plan of this paper a heading which was to

deal with the lessons to be learned from the facts placed before you I cannot, however, do so to day, perhaps some other opportunity may present itself I will only say that it is obvious that any changes which will free Bombay or India of plague can only be introduced gradually, as the people become more educated and civilised, and learn that rats are the most important factor in the spread of the disease. If we cannot speedily place a distance between ourselves and rats, we can at least protect ourselves from the danger of their propinquity by acquiring immunity to plague by inoculation. This, is to my mind the only measure that offers any hope in combating the disease in the near future.

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SOME CLINICAL FEATURES OF QUARTAN MALARIA *

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THE most striking feature of the series of cases of quartan malaria on which my observations have been made has been the absence, in the majority, of the characteristic quartan pyrexia. The extraordinary periodicity of the pyrexia, which gave a name to the fever in ages long gone by, and which enabled the physicians of those days to differentiate it from the host of other fevers, was absent in no less than 60.6% of my cases. But for the examination of the blood, the essential element in many of the cases would have been overlooked, and the treatment futile.

In this outline of the clinical features of the disease, I will not attempt to describe all the well known symptoms and stages of a simple case of the fever. Suffice it to say, the headache, malaise, shivering, etc., were present to a greater or less degree in all cases. These simple cases were in the minority, and in depicting the clinical aspects of the majority, I cannot do better than group the cases according to the symptom which was most prominent in the patient's mind, the one which, in fact, brought him to the hospital.

(1) *Fever* — Although the fever was not characteristic in many of the cases, it was by no means absent in the

majority, in some there were daily rises of temperature in others an occasional rise at long intervals. Of a total of 83 cases, 1 absconded on the day of admission, 16 received quinine within three days of admission, and 66 did not receive quinine for at least three days after admission. Taking cases with pyrexia attacks separated by two days of apyrexia, and those with two days of pyrexia separated by one day of apyrexia, as recognisable single and double infections—the 66 were divisible into 26 recognisable (23 single and 3 double infections), and 40 unrecognisable as quartan malaria.

The reasons for these 40 cases being unrecognisable were the following — In 16 there was an irregular pyrexia, for the most part quotidian, in 9, the temperature rose once in an average of 8.8 days (i.e., once in 12, 10, 8, 13, 6, 5, 7 and 9 days respectively, in 2 of which the rise occurred on the 9th day of admission), in 2, the temperature rose twice in 13 and 18 days respectively, in 1 it rose thrice in 18 days, and in 12, it was normal for periods averaging 6.4 days (7, 2, 12, 9, 8, 3, 4, 11, 4, 6 days, after which quinine was administered although the temperature remained normal).

The following table shows an Analysis of the Temperature Charts of 66 cases of quartan malaria.

	No of Cases	Percentage
Recognisable (single or double)	26	39.40
Unrecognisable Pyrexia, mainly quotidian	16	24
Do do at long intervals	12	18.18
Do do absent	12	18.18
	16	100.00

It is thus seen that in 36.36% of the cases pyrexia was noticeably absent, and in 18.18% the temperature was normal. Of the 12 cases with normal temperatures, 4 had triple infections.

Under the microscope the infection was recognised as triple in 30, double in 8, and single in 44 cases, while in one with the characteristic temperature chart of a single infection, prolonged examination of the blood from the finger and the spleen revealed numerous unpigmented amoeboid parasites and crescents, but not a single pigmented parasite distinguishable as quartan.

Before passing from the subject of temperature the great tendency towards the disappearance of pyrexia by simple rest in bed should be noted. In 14 cases the temperature became, and thereafter remained, normal in an average of 3.4 days.

In a few cases, an attack was missed, but was succeeded by one due to the same parasitic group.

Cases 767, 617 and 222, 965, 436 illustrate some of these points.

(2) *Œdema* — After fever, the patient usually complains of swelling. This varies in amount, in some there is only slight œdema of the feet, in others it is a more prominent feature, but is still moderate in amount, involving at times the legs and hands, at other times eyelids, while in a third group, the legs, arms, abdomen, chest and face are greatly swollen, the pleural cavities half filled with fluid, the lungs water-logged and full of moist râles, and the patient will sit up gasping for breath. In these cases of severe hydrops the condition directly threatens the patient's life.

In these cases, the patient may complain of fever, or there may be pyrexia of which the patient is unconscious, or there may be a normal temperature for considerable periods at a time.

There is usually a loud hæmic murmur at the third left costal cartilage, and there may be murmurs at the tricuspid and mitral valves. Examination of the urine may reveal nothing abnormal, or the urine may throw

* Revised and sent for publication by author — Ed, I M G

down a dense deposit of tube casts and become solid on boiling

The active agent in these cases of oedema is the malarial parasite, and the administration of quinine has often a marked effect on what appear to be severe cardiac or kidney affections

In the series of 83 cases oedema was prominent, i.e., was moderate or great in amount in 27 (32%), and in 15 (18.0%) was so great as to overshadow all other features of the case. Of these 15 cases, the microscope showed a triple infection in 12, double in 2, and single in 1. The temperature charts were characteristically quartan in 4, while in the other 11, 5 showed irregular pyrexia, 3 no pyrexia for 27 and 12 days, respectively, 2 had pyrexia at long intervals (8 and 9 days), and 2 received quinine immediately on admission. The urine was normal in 5, contained a slight amount of albumen in 1, contained a considerable amount in 5 (in 2 solid on boiling), and in 4 there is no record

Cases 775, 379, 1296, and 464 are good examples of this condition, and they will be recognised as cases that would formerly have been classified as malarial cachexia. Nevertheless they were active infections of the quartan parasite, or cases of chronic malaria *

(3) *Diarrhoea or Dysentery*—The next group is that in which diarrhoea or dysentery was the most prominent feature. For obvious reasons this symptom impressed itself strongly on the sufferers, and made it the main, and in two, the sole ailment of which they complained. In 17 or 20.4% of the 83 cases there was diarrhoea or dysentery on admission

In the absence of a scientific classification of bowel-complaints, I would divide these cases into ten which were cured by rest and milk diet before quinine was given, and seven which resisted all treatment, of whom 3 died and 4 absconded. In the former the diarrhoea was probably due to food unsuited to a patient with pyrexia. In the latter it was probably due to an independent infection. In none of my quartan cases has the bowel trouble appeared to be purely malarial, yielding only to quinine

Cases 436, 965, 464 and 1296 had intestinal derangements as well as malaria.

I have traced the various appearances of quartan malaria, first, as characterised by more or less definite pyrexia, then, as the host becomes weaker, with less tendency to pyrexia. A stage of malarial cachexia or chronic malaria is now reached, the patient becomes water logged, and death is due to cardiac weakness. In some, the brunt of the disease appears to fall on the kidneys and chronic parenchymatous nephritis ensues

Naturally, in such patients, infections by other organisms readily take place and complicate the existing malaria. Among these new infections, diarrhoea and dysentery are by far the most important, and they accounted for 5 of the 8 fatal cases

(4) *Infection by Pyogenic organisms*—Septic organisms also have an opportunity of asserting themselves, and in five cases the patients suffered from abscess. In three the abscess was single and in two multiple

These abscesses are frequently of large size and often comparatively painless. They may be the complaint for which the patient seeks relief. In another case thrombosis, beginning in the vessels of the thigh, caused death

(5) *Pulmonary complications*—In nearly all cases of malaria there is a cough, in a considerable number severe bronchitis. But the pulmonary troubles do not stop there. Pneumonia frequently follows on the cachectic condition. It is significant that at a time when one estate was suffering severely from quartan malaria, an epidemic of pneumonia, due to Frankel's diplococcus,

also occurred. There were 15 or 16 cases within a few weeks. In one case on this estate I found quartan parasites a few days before the patient was admitted to hospital with pneumonia

(6) *Association with other diseases*—This outline would not be complete without some mention being made of the frequency with which quartan malaria was found in association with other diseases besides diarrhoea and abscess. Those who have seen how rapidly a healing ulcer will break down during an intercurrent attack of malaria, will readily understand that ulcers are frequently found in cases of quartan malaria, and that the ulcer may be the sole complaint recognised, until some slight rise of temperature leads to an examination of the blood

In two cases the patients were attacked by beri-beri after the onset of the fever

In one case (1273) a severe malarial infection was combined with and disguised by alcoholic cirrhosis of the liver, while in a case of scalp wound, where the patient said he had passed blood in his urine after the injury, but whose temperature was normal, parasites were found in considerable numbers. In this case, and also in another who suffered from a soft chancre and in whose blood parasites were found, there does not appear to be much connection between the two affections, nevertheless, the importance of accurate diagnosis cannot be gainsaid, when it comes to treatment

Prognosis and Mortality—When neglected, the disease as has been seen, frequently leads to serious results. On the 83 cases, 8 died in hospital, 5 from diarrhoea or dysentery, one from beri-beri, one from cirrhosis of the liver, and one from thrombosis

This gives a death-rate of 9.6%. If to these be added the four with diarrhoea who absconded unimproved, and who would almost certainly die, there is a death rate of 14.4%

Apart, however, from these cases, which were almost hopeless from the first, the prognosis is extremely good, even in severe cases of the cachexia

The Effect of Quinine—In conclusion, it only remains to be said that quartan malaria is, in the most striking way, amenable to quinine. It is rare for more than one attack of pyrexia to occur after the exhibition of the drug in ten grain doses night and morning. In my series more than one attack took place in only three cases

In one of these there were two attacks, in another three attacks, and in the third (case 965) I failed to eradicate the fever. This was a case complicated with chronic dysentery, and it is questionable if the quinine was being fully absorbed. The dose was then raised to ten grains three daily, but before the effect could be fully observed, the patient absconded. It is probable that this dosage would have been sufficient to stamp out the malaria

The following is a record of illustrative cases—

CHRONIC MALARIA—GREAT OEDEMA—DEATH FROM THROMBOSIS

Case 379 Tamil, *et* 47 Admitted, 26th March 1902

He stated that he had had fever about three months before admission. It had lasted for a month and a half. He had now swelling of the whole body, difficulty in breathing and a moist cough, and was so weak he could not walk. His bowels were costive

On examining him the day after admission, I found his skin warm. Temperature 101.4° F. He, however, absolutely denied having had fever for 1½ months, and was not conscious of the fever that day. He had considerable dyspnoea and was anemic. There was great swelling of hands, feet, abdomen and scrotum. There were râles in his chest. His spleen could be felt through the ascitic fluid. Urine normal. Heart normal, but for a hæmic murmur

On 30th March his temperature was 100.2° F, thereafter it was normal

On the 28th numerous half grown quartan parasites were found and on the 2nd April, rosettes, parasites

* NOTE—It is interesting to observe that although quartan malaria forms only a small minority of the malaria cases admitted to hospital it supplies practically all the cases of malaria cachexia malignant malaria rarely presents itself in a chronic form, being very fatal to the Tamils and Chinese from whom the cases are drawn

filling the whole corpuscles, gametes and a flagellated body were seen

On the 28th March he was put on a mixture with digitalis, and on the 4th April ten-grain doses of quinine. By the 11th April the oedema had almost disappeared, but on the 14th he developed thrombosis of the vessels of the right leg and died on the 16th

CHRONIC QUARTAN MALARIA WITH CIRRHOSIS OF THE LIVER.

Case No 1273 Tamil, æt 35 Admitted, 6th December, 1902

Complained of swelling of the abdomen of 3 months' duration. He gave, but only after enquiry, a long history of malarial attacks for two years. He said he had had no fever for a month. He also admitted taking alcohol to excess on every opportunity. There was slight oedema of the legs, but the ascites was marked. Heart normal. There was dulness and weakness of the respiratory murmur over the lower two-thirds of the right lung. Pulse 84, respiration 20, no cough. Urine contained a trace of albumen and casts, hyaline and granular. Parasites in all stages were found in the blood from the 11th to the 18th. On the 17th the temperature rose to 102.4° F, but the patient was absolutely unconscious of it, he felt neither cold nor hot, and had no sweating after it. This was the only day on which fever was present, quinine was given on the 20th December.

The record in this case thereafter was mainly of a series of tappings, which failed to do any permanent good. Oedema became more pronounced in the legs, and began to spread up to the thighs. The urine became very scanty. Albumen, which had disappeared from the urine, returned and the prognosis was very gloomy.

On the 14th of February I incised the abdomen and stitched the omentum to the parietes. The operation occupied thirty minutes. The patient seemed to do well for a couple of days, but then diarrhoea started, the urine became very scanty, and death occurred on 20th.

QUARTAN MALARIA WITH PARENCHYMATOUS NEPHRITIS

Case 464 Tamil, æt 16 Admitted, 28th May, 1903

Gave a history of having had many attacks of fever in the previous two years, two or three attacks each month. Four months before admission she had noticed her feet had begun to swell, and it was for swelling of the whole body she now sought admission. She had not been able to work for a month, and not able to walk for ten days. She thought she got fever at times, and, when it came, she sat in the sun for heat. For eight days she had had diarrhoea.

The physical condition of this patient can be best described by saying that she was absolutely water-logged. She was greatly swollen and sat up gasping for breath. On the chest walls the oedema was an inch deep at the level of the third rib. Over the lower part of the abdomen and legs the skin was covered by drops of serum, which exuded through. Not even the stomach note could be detected in the abdomen. The right lung was dull to percussion up to the angle of the scapula, and in both there were numerous coarse crackling rales. The cardiac sounds were well heard, and there was no murmur. The pulmonic second sound was accentuated, and frequently there was reduplication at the base. Tongue clean, pulse 96, of fair tension and regular. The respirations, numbering 40 per minute, were accompanied by a wheeze and frequently by a cough. The voice was hoarse from oedema of the glottis. The urine was very dark coloured and smoky, the reaction was acid, Sp Gr 1016, albumen quarter on boiling, no sugar, marked guaiac reaction, no bile pigment reaction, dense deposit containing leucocytes, a few erythrocytes, granular, epithelial and blood casts, vesical cells and brown debris. Dr DAVIELLS kindly examined the urine and reported a trace of methæmoglobin. From 8 P.M. to 8 A.M. on the night of the 28th only 8 oz. of urine were passed.

The temperature was 101° F on the day of admission thereafter normal. Quinine was begun on the 29th.

On the day of admission many parasites were found in the blood, and even up to the 2nd of July a parasite was seen. On the 3rd patient seemed a little better and had passed more urine. The diarrhoea, however, persisted, and on the 5th she died. *Post mortem* examination showed chronic parenchymatous nephritis.

QUARTAN MALARIA WITH DIARRHOEA

Case 436 Sikh, æt 30 Admitted, 9th April, 1902

Complained of pain in the abdomen aggravated by food, for which he had a craving.

He had had diarrhoea for twelve days and occasionally fever. On admission he received castor oil and was put on milk diet. Liquid motions continued until the 15th.

On the 11th, 17th, 20th and 23rd, his highest temperatures were recorded as 102.2°, 102.6°, 101.8° and 102.6° F, respectively, on other days it was normal. Quinine was begun on the 21st.

Parasites were found in his blood from the 12th to the 23rd. On the 30th none could be found. No pyrexial attack took place on the 14th as might have been expected.

DOUBLE QUARTAN MALARIA BECOMING SINGLE

Case 617 Chinaman, æt 22 Admitted, 3rd June, 1902

Complained of fever for twelve days with headache, giddiness, etc. On the 3rd, 10 A.M., the blood contained (1) many rosettes, (2) many with just a trace of hæmoglobin, (3) a few two-thirds grown, (4) many unpigmented parasites.

His temperatures were on 3rd, 104.8°, 4th, 101.8°, 5th, 98.4°, 6th, 104.4°, 7th, 103.8°, 8th, 98.8°, 9th, 103.2°, 10th, 98.2°, 11th, 97.6°, 12th, 102.0°, 13th, 99.4°, thereafter normal. Quinine begun on 12th.

On the 8th, 2 P.M., many rosettes were seen, but only one half grown parasite. In this case one generation of parasites practically disappeared from the blood, and with its disappearance, the temperature chart resolved itself into that of a single quartan, which was easily cured by quinine.

TRIPLE QUARTAN MALARIA—QUOTIDIAN FEVER.

Case 767 Tamil, æt 20 Admitted, 17th July, 1903.

Complained of daily fever of six days' duration. He said that for three years he had suffered from fever. He was considerably emaciated and very anæmic. His feet and face were slightly oedematous. Spleen enlarged. There is an ulcer on one leg. The bowels were regular.

On 29th July he absconded, but, two days later, returned, and again absconded on August 8th.

His highest daily temperature from the 17th to the 28th were 103°, 103.6°, 102.6°, 104.4°, 101.2°, 103°, 104.2°, 98°, 102.2°, 98.2°, 102°, 101.4°, 98.2°. Two ten-grain doses of quinine were given on the 22nd, and one on the 23rd. After readmission he had temperatures of 102.2°, 101.2°, 100.4°, from the 5th to the 8th, normal.

Large numbers of triple quartan parasites were to be found, but, under a simple mixture of iron, improvement followed.

CHRONIC QUARTAN MALARIA—MALARIAL CACHEXIA

Case 775 Chinaman, æt 31 Admitted, 26th May, 1901

Complained of swelling of the feet of two months' duration. The swelling had gradually increased, and his abdomen was now somewhat swollen. He also complained of an ulcer on each leg. He could walk, and said he had a good appetite. His bowels were regular. Three months ago he said he had fever for ten days, but received European treatment and was cured.

On examination he was found to be anæmic. There was considerable oedema of the legs and abdomen. The spleen could be felt enlarged. Heart, lungs and urine were normal.

There was no complaint of recent fever, and the case was considered one of malarial anæmic or cachexia. On examination on the 28th his skin appeared abnormally warm, and his temperature was taken for some time every two hours during the day-time. The chart shows the highest and lowest records. The fever was usually very slight. On the 13th he absconded at 2 P.M., but returned at 6 P.M., when his temperature was 98° F. saying he had had fever.

His temperature were 1st, 101.4°, 4th, 100.2°, 7th, 100.4°, 10th, 100.4°, 15th, 101.2°, 19th, 103.8°, 21st, 100.4°.

Quinine gr. v twice daily was given on the 21st and increased to gr. x twice daily on the 24th. From the 21st the temperature was normal.

Under quinine the œdema rapidly disappeared, and the patient made a good recovery.

CHRONIC QUARTAN MALARIA WITH RENAL COMPLICATION

Case 1296, Chinaman, at 27 Admitted, 13th December, 1902

Complained of having had fever for seven months. It came on at irregular times. For three days had diarrhoea, passing daily three or four liquid motions, mixed with mucus. He had a feeling of fulness in the stomach and griping pain. He had been in Jeram Convalescent Hospital for beri-beri 15 months ago. On examination he appeared fairly comfortable, and his skin had a healthy tan. Conjunctiva and lips were not markedly anæmic. Tongue was a little furied. There was slight œdema of the legs, abdominal wall and back. Pulse 48, of good tension and regular. Respiration 23 per minute. There was no cough. Visible impulse of heart's apex was on the fourth space, just above and including the nipple. The precordial dullness, 5 inches across, extended 1½ inches to the right of the middle line. The sounds were normal except for a reduplication of the second sound at the base. There was no murmur. Lungs were normal. Hepatic dullness measured 4½ inches in nipple line. The liver was not tender. Splenic and cardiac dullness met 1½ inches below the nipple. The spleen dullness did not extend beyond the costal margin. Knee jerks were normal.

From the 14th to the 18th parasites were found in the blood, but on the 22nd none were found.

His temperature rose to 103.4° on the 15th, otherwise was normal throughout. Quinine begun on the 22nd.

The urine, the interesting feature of this case, was densely loaded with albumen on the 17th. It was acid, pale amber in colour and, on boiling, became practically solid. There was no blood or sugar. A considerable white deposit contained numerous casts, mainly hyaline, but mixed with a few granular. Simply under rest in bed the parasites disappeared, the urine rose from 36 oz. on the 15th to 120 oz. on the 21st in the 24 hours, and the albumen was greatly reduced. After the administration of quinine the albumen was found to have disappeared by the 27th.

QUARTAN MALARIA ADMITTED FOR MULTIPLE ABSCESS

Case 287 Chinaman, at 30 Admitted, 26th March, 1903

Complained of pain and swelling of the left arm and left leg. Patient was anæmic, and gave no history of dysentery, diarrhoea or fever.

On the 28th an abscess in the arm was opened.

On the 31st one in the thigh.

By the 2nd April the temperature chart suggested quartan malaria, but a careful examination on the 5th discovered no parasites. On the 8th, however, an unpigmented and a pigmented quartan parasite were found.

On the 11th April a large gluteal abscess was opened. On the 13th another in the thigh, and on the 20th yet a third on the same thigh. Patient then appeared to make satisfactory progress, until the onset of diarrhoea on the 26th April. This continued till death on the 29th May.

The urine contained a trace of albumen but no casts, and was passed in quantities ranging from 25 to 50 ozs. in the 24 hours.

A pure culture of staphylococcus pyogenes aureus was grown from the abscess in the buttock.

CHRONIC QUARTAN MALARIA DEVELOPING MULTIPLE ABSCESS IN HOSPITAL

Case 915 Tamil, at 22 Admitted, 22nd October, 1903

Complained of great œdema of the legs, abdomen, arms and face. She could not lie down and had a troublesome cough. She said she felt hot always, but never shivered, and did not know when the fever came.

She had had diarrhoea for some time, and altogether had been ill about three months.

The heart was normal except for a hæmic murmur lungs full of mucus râles, and œdema great. Pulse 100, respiration 32. Marked anæmia, urine contained distinct albumen, no sugar, numerous hyaline and granular casts.

Quartan parasites were found in the blood on the 27th. No ova were found in the fæces on the 29th, on which date the temperature ran up (previous to the 29th the temperature had been normal), and a cellulitis began in the right thigh. This was ultimately incised on the 2nd October. On the 10th a large painless abscess on the back was opened, and on the 13th an abscess of the left leg was opened. Progress was then steady, the œdema rapidly disappeared, and, on the 8th December, the urine was recorded as normal and the patient strong and well.

DOUBLE QUARTAN MALARIA WITH CHRONIC DYSENTERY

Case 935 Tamil, at 34 Admitted, 8th September, 1902

Complained of passing blood and mucus for the past 15 days. Patient was greatly emaciated. He also said he got fever every two days. Practically for the whole period during this patient's stay in hospital he had liquid or semi-formed motions, but there was a slight tendency to improvement. No ova could be found in the motions. On the 17th a parasite was found in the blood, and the patient was put on quinine. The temperatures, which were recognisably double quartan, then became much more pronounced and quinine failed to control them although it was increased to grs. x t i d. No parasites could, however, be found in the blood after the administration of the quinine.

On the 14th October there a relapse, ten liquid motions were passed, and the patient absconded on 17th October.

A Mirror of Hospital Practice.

TWO CASES OF ANEURISM OF THE COMMENCEMENT OF THE DESCENDING AORTA WITH RADIOSCOPIC AND POST-MORTEM APPEARANCES

BY OLAYTON LANE, M.D. (LOND.),
CAPTAIN, I.M.S.

Case 1—A European male, aged 36 years, was admitted into the Presidency General Hospital on 3rd November 1904, stating that he had been ill since May with persistent cough. For the last ten days he had had "rheumatism" of the left side and left back of the chest with night sweats, and during the last week his sputum had been tinged with blood. He had, he said, lost flesh.

The family history was good, he had had rheumatism as a child and gonorrhoea a year ago. He denied having had syphilis.

The cough was loud and "brassy" The right side of the chest moved freely, was hyper-resonant with free air only and loud breath sounds, the left side was nearly motionless, dull all over, and quite silent to auscultation except for a small portion of the base in front.

The heart's dulness did not reach to the right of the sternum, there was pulsation in the fourth and fifth left spaces beside the sternum, the sounds were normal without murmurs, nor was any murmur to be heard in any other part of the chest. The two radial and carotid pulses appeared equal, there was no tracheal tugging and no abnormal pulsation in the chest or neck. The veins of the neck and of both upper limbs were distended, with prominent valve-knots.

Radioscopic examination—Showed that the right side of the chest was normally transparent, the left so dark that the outlines of the ribs could not be distinguished, the heart was not displaced to the right, in the second right space, close to the sternum, was a faint shadow with its convexity to the right. He was examined lying supine with the tube under the bed and the screen in front.

A diagnosis of a mediastinal tumour, probably an aneurism, was made, pressing on the root of the left lung and also extending somewhat to the right as shown by the Röntgen rays. It was considered from the hæmoptysis that it was pressing on and eroding a bronchus, probably the left, and that rupture might be eminent. It was for this reason that he was examined by the Röntgen rays in the reclining position, so as to get a view with the fluorescent screen posteriorly, and that the band of the Riva-Rocci manometer was not applied.

Treatment consisted in restriction to bed, a grain of Cutte's peptone once daily, five minims of liquor trinitini and ten grains of iodide of potassium thrice daily to lower arterial tension, for the same reason the cough was treated by opium and a linctus. To increase the coagulability of the blood, he received a drachm of chloride of calcium by mouth, and an enema of gelatin and water, an ounce to a pint.

He continued in much the same state till the coming of the 6th, at which time his breathing became more hurried and laboured, there was marked difference in the two radial pulses, the left being the smaller, and he was in great distress. A quarter of a grain of morphia relieved him and gave him a comfortable night. For the first time his temperature rose above normal, reaching 101°. Next morning, he was sweating profusely with a small easily compressible pulse, the wave in the left being a little smaller than that in the right. There was blood tinged sputum in considerable amount, and breath sounds could be heard at the left back from the apex to the angle of the scapula. His pulse rate was 120, and he seemed so low

that two ounces of brandy had to be given in 24 hours and the vaso-dilators were stopped.

On the 8th November, after a bad night, his pulse rate was 130, and for the first time there was noted in the first left space, extending out about an inch from the sternum, a pulsatile area, over which was also to be felt a diastolic shock. There were no breath sounds to be heard over the left half of the chest. He died about noon next day.

Post-mortem examination—Permission to examine the chest was obtained, and this was done two hours after death. There emanated from the unopened body a putrid smell. The right lung weighed 9½ ounces, and was normal except for a little basic congestion, there was no oedema. The left lung weighed 3 lbs 2 ounces, and retained its shape as does the liver. It was large and deep-blue in colour, unless except for a fringe at the extreme base, and on section full of blood, friable, and sinking in water. The heart weighed 7 ounces. There was no distension of any cavity nor hypertrophy of the walls, the valves were all normal. The aorta, from its origin to just beyond the point where the left subclavian artery originated, was thickened and atheromatous but not dilated. Beyond this lay a large fusiform aneurism 5 inches in diameter, the sac of which was largely false, and which was lined by a thick layer of organised clot weighing 9 ounces, putrid, with a central channel along which the blood had flowed. The fronts of the bodies of the 4th, 5th, 6th and 7th dorsal vertebrae were eroded, the erosion being placed more to the left than to the right, and the intervertebral cartilages not being affected. In front pressure had been exerted on the left bronchus, in the wall of which lay an ulcer measuring about 1 by ½ an inch, its long axis being in the long axis of the bronchus. The bottom of the ulcer was formed by the organised clot contained in the aneurism, and it was by this route that the clot had become septic. It was evident by passing a finger into the aneurism and another into the pulmonary vessels that when full the aneurism must have pressed upon the left artery and vein to the point of obliteration of their lumina, and to a less extent on the right vessels.

Case 2—A European male, aged 32 years, was admitted into the same hospital on 14th November 1904, for a cough. He stated that he had had severe pain over the heart, for which he was admitted into this hospital in May 1903, and which disappeared under treatment. In May, this year, he was treated at another hospital for the same pain coming on at night only. A week before his admission here, that is, about the 7th November, the pain became constant, being present night and day, and at the same time a cough appeared.

This cough was found to be of a "brassy" character, there was no difference in the radial pulses nor in the pupils. The most striking

feature was severe dyspnoea with a free air entry into both lungs, but somewhat less into the left than into the right. There was no tracheal tug, no abnormally dulness over the upper part of the sternum nor adjacent spaces, and no abnormal pulsation. The heart was not enlarged to percussion, but the second sound in the neck was accentuated. The pulse wave at the wrist appeared to be with difficulty compressible, but the blood-pressure in the tracheal artery, measured by the Riva-Rocci manometer with a 10 cm band was normal, namely, 120 mm of mercury. The liver and spleen were not enlarged, the urine had a S. G. of 1018 and contained no albumen.

Radioscopic examination—Cleared up a case which was otherwise obscure by showing, most clearly with the bulb anteriorly and the screen posteriorly, a definite pulsatile shadow, less dense than that of the heart, lying above that organ and apparently being about half its size. It extended more to the left than to the right. The lungs were normally transradiant, and the outline of the diaphragm clear and distinct on both sides and moving normally.

Treatment was on the same lines as in the last case.

He had a bad night without sleep for the third successive night, the reason being that when he became drowsy he was at once awakened by a feeling of suffocation, apparently because the extraordinary muscles of respiration were essential to carry out the act.

Early on the next morning he fainted while lying in bed, when seen later he had a small easily compressible pulse, and was perspiring profusely. He looked very ill. There was much dyspnoea, but free entry of air, greater on the right than on the left side, with a generally distributed bronchus, evidently produced in the larynx or trachea. There was yellowish expectoration partly tinged pink, no murmurs were audible, but tracheal tugging was to be felt. His distress was such that the back was not examined. He continued in much the same state till 1-15 P.M., when he died rather suddenly. His highest temperature while in hospital was 99.2°.

Post-mortem examination showed that the left lung was congested throughout, but not cedematous. The right was neither congested nor cedematous. The heart weighed 7½ ounces and was normal except that the left ventricle had a wall of ⅔ inch thick.

The aorta from origin to termination was atheromatous. In the posterior wall of the first portion of the descending aorta was an oval opening with its long axis vertical, measuring 1½ by ⅔ inch, leading into a false aneurismal sac, formed by the consolidation of surrounding structures. Its posterior boundary consisted of the middle of the anterior surfaces of the 5th (to a slight extent only), 6th, 7th, and three-quarters of the depth of the 8th dorsal vertebrae. Over this area he bodies

of these vertebrae were eroded, the erosion extending more to the left than to the right and spacing the intervertebral cartilages. The sac extended behind the roots of both lungs, pressing on both bronchi and both pulmonary vessels. The bronchi were normal with no absorption nor ulceration of their coats. The sac had ruptured by a small opening about one-eighth of an inch in diameter into the left pleura, which contained 4½ lbs of recent blood clot and 13 ounces of red serum. There was some adhesion of the visceral pleura to the aneurismal sac close to the opening, an evident slight but wholly inadequate attempt at strengthening of that structure. The aneurism contained no laminated clot.

The kidneys were tough but the capsules stripped readily, and the other organs showed no abnormality except pallor. There was a scar on the penis.

Comment—These two cases of aneurism, occurring in the same part of the aorta, were in other respects very different. In the first there was a natural process of cure going on, which might have had a satisfactory result, had not micro-organisms gained access from the ulcer in the left bronchus to the organised clot, and given rise to the sapraemia or septicæmia from which he died. Although the clot was extremely offensive, and its smell pervaded the *post-mortem* room before the body was opened three hours after death, yet during life there had been no odour in the breath or sputum. This would seem to show that the tension in the aneurism had been sufficient to close the left bronchus and permit of no escape upwards of the offensive matter. In this connection it is questionable to what extent the blood staining of the sputum came from the infarcted lung or from the aneurismal clot, probably it came from the lung for these reasons. It is noticeable that a lowering of arterial pressure, as estimated by an increasing weakness of the pulse, was accompanied by a considerable increase in the amount of sputum, and it may be concluded that this was due to the shrinking of the aneurism, allowing of escape of stained blood-serum from the lung. That the left bronchus was at this time slightly patent is confirmed by the fact that it was then that breath sounds were heard over a wide area at the back of the left lung. From the state of the lung after death it is impossible to believe that it had so recently contained air, and the only reasonable explanation of this fact is that with the left bronchus patent the sound caused by the passage of air up and down the right bronchus was transmitted by a continuous column of air down the left bronchus to the solid lung and go to the chest wall. With the bronchus closed the column of air would be interrupted and conduction of sound would cease. If by these means fluid was permitted to escape from the lung, it would dilute any exuding from the aneurismal clot and lessen offence, but the explanation of its entire absence does not seem clear.

In the second case there was no natural attempt at cure by the deposition of organised clot, and little by the adhesion and consolidation of surrounding structures. The absence of signs of fluid in the pleural cavities, both to the ordinary methods of investigation and more particularly to the fluorescent screen, renders it certain that no bleeding had taken place into the left pleura on the evening before his death. It evidently began when he fainted on the morning of the 15th November, and yet he lived seven hours later.

It is desirable to draw more particular attention to the aid in diagnosis rendered by the Röntgen rays in these two cases. In the first the fluorescent screen confirmed the fact that the heart was not displaced, the lung aëless, and in addition showed the shadow of a body lying to the right of the upper part of the sternum, and was of marked aid in assisting in the diagnosis that the symptoms were caused by a mediastinal "tumour" pressing on the root of the left lung and left subclavian artery as well as on the innominate veins or superior cava. The shadow did not show pulsation, a fact explained by the amount of organised clot found after death in the aneurism. In the second case the screen at once established the diagnosis of aneurism and cleared up immediately what was otherwise a doubtful and obscure case. There appears to be a general want of appreciation of the fact that the Röntgen rays are of more value in the diagnosis of diseases of the chest than of injuries to and diseases of bones, and it is probable that, were it realised that, instead of being useful merely in certain rare cases, they are of great value in every day practice, there would be many more installations in India than there at present are.

A CASE OF "MISSED ABORTION"

By J. C. HOLDICH LEICESTER, M.D., B.S., B.Sc.
(LOND.), F.R.C.S. (ENG.),

CAPTAIN, I.M.S.,
Resident Surgeon, Eden Hospital

MRS. A —, Eurasian, aged 17 years, married 5 months, came to the Out-patient Department of the Eden Hospital on September 16th, 1904, complaining of pain in the lower abdomen for the past month and amenorrhœa since April 19th. She was very anæmic. On examination of the abdomen a tumour, typical of a pregnant uterus, was found rising up out of pelvis, reaching nearly to the level of the umbilicus. Fœtal parts were felt, but no fœtal heart sounds could be heard. Nothing else abnormal was felt by the abdomen. By vaginal examination the cervix was found to be typical of pregnancy, the rectum and intestines were loaded with feces, but nothing abnormal could be detected. A diagnosis of pregnancy was made, the pain being probably due to constipation. A mixture

of salines with potassium biomide was ordered. The patient was not seen again until October 29th, when she once more attended the Out-patient Department for severe pain in the abdomen of two days' duration and a blood-stained discharge. On examination a smooth tumour was felt rising up out of the pelvis, reaching to $1\frac{1}{4}$ inch below the umbilicus, it was very soft and fœtal parts were very indistinct. Per vaginam the cervix was not taken up, the os was closed, and there was a slight mucoid discharge. She was admitted into hospital and the following further history obtained —

"On October 27th, she had occasion to lift some heavy weights, and on the same evening severe pains came on in her abdomen and small of the back. During the night, she passed per vaginam, what she thinks was a lump of mucus, and had a very scanty mucoid discharge, slightly tinged with blood, which continued to the time of admission into hospital. The pain also continued, but was not so severe and was intermittent. It was not relieved by any posture. She fancied she felt the child move on the night of the 27th for the first time during pregnancy, but is not at all sure of this.

Past Personal History — Patient thinks she became pregnant in April. In June, several attacks of vomiting occurred at intervals of two to three days but not specially in the early morning. She has suffered from fainting fits throughout her pregnancy and slight fever off and on. In July, she got slight pains in her lower abdomen which she attributed to constipation and which were relieved by aperients. In September another similar but more severe attack occurred with a white discharge, for which, as stated above, she attended the Out-patient Department and the medicine then prescribed stopped the pain and relieved the discharge. Since September her appetite has been very poor and she had sick headaches at times.

There was nothing of any importance bearing on the case in the family history.

Menstruation — Began at the age of 13 years. Scanty. Lasts four to five days. Pain the day previous to, and one or two days following, onset of flow. Always irregular, at times misses a period and often goes $1\frac{1}{2}$ months between periods. Missed a period in March. Last day of last menstruation April 19th.

Discharge — White discharge since September. Scanty blood-stained mucus discharge from October 27th to October 29th, ceased on the latter date, but began again on the morning of the 30th. Bowels very constipated.

Micturition — Normal.

The further history of the case is as follows —

On the morning of the 31st October at 4 A.M. patient had a simple enema (as she was very constipated) with good effect, after which she went off to sleep, and whilst sleeping, at 6 A.M. the membranes ruptured, liquor amni dribbled away and pains like labour pains began, but

shortly ceased. On examination, at 8 A.M. there was a "Show," but no dilatation of the os, nor was the cervix taken up. Pains began again, much more strongly at 3 P.M. with a bright blood discharge, and on examination the os was found to be four fingers loose, with a soft head of a foetus protruding through it into the vagina. After a short interval at 3-20 P.M. a dead, somewhat shrivelled foetus was delivered complete, with cord and placenta attached to it. The placenta was a little rough, and so the uterus was gently scraped with a blunt flushing curette and iodine lotion. An iodoform gauze drain being afterwards inserted, which was removed the following morning.

The foetus measured $7\frac{1}{2}$ inches in length and weighed just over 12 ozs., it had the appearance of having been dead some considerable time, as it was somewhat shrivelled up, though not all decomposed, and very slightly macerated. There were some old hæmorrhages into the placental tissue.

Patient made a normal uneventful recovery and was discharged on November 10th, the uterus being well involuted.

The case appears to be one of undoubted missed abortion. The foetus had probably died just before she first attended the hospital in September as uterus then was the size of about five months' pregnancy. The pain she then complained of may have been the threatening onset of labour which, however, passed off again, and the foetus, being retained in utero for a further period of six weeks. As to the cause of death of the foetus, it seems likely that this may have been due to the hæmorrhagic effusions into the placenta, though the cause of this latter condition was by no means clear.

I am indebted to Miss Flora Singh, the Clinical Clerk, for her careful notes of the case and to Lt.-Col. F. S. Peck, I.M.S., for his kind permission to publish the same.

NIGHT-BLINDNESS

BY HENRY SMITH, M.D.,

MAJOR I.M.S.,

Civil Surgeon, Jullunder.

THERE has appeared a good deal on the treatment of night-blindness within the past few years in the medical journals, which would lead people, who are very easily satisfied with evidence, to the conclusion that night-blindness is a single simple entity and functional. Such is very far from being the real state of affairs. I propose to relate the following series of cases taken just as they come without any selection or exclusion, except in so far as I exclude syphilitic cases, observed at the Jullunder Civil Hospital in the Punjab within a few months.

Night-blindness is a symptom very prevalent in the Punjab, and in my opinion we have to deal with chiefly *retinitis pigmentosa* and *retinitis*

pigmentosa sine pigmento. It will be observed in the cases related that only one case of *idiopathic* night-blindness occurs, though the area from which patients were coming to Jullunder covered a good deal of famine-stricken country. In my experience *idiopathic* or *starvation* night-blindness is exceedingly rare in the Punjab*. In the cases I relate a diabetic case, and such cases are not rare in a country like India, in which diabetes prevails to a much larger extent than it does in Europe. I also relate a few cases of *malarial retinitis*, inasmuch as I am of the opinion that *retinitis pigmentosa* and *retinitis pigmentosa sine pigmento* have often their origin in malarial fever, and also as I consider that malarial retinitis is of very much more frequent occurrence than is commonly recognised.

In the cases in which syphilis is not mentioned it has not been overlooked. In my experience of Northern India syphilis is a comparatively rare cause of disease of the eye outside cantonments and towns of over 1,00,000 population.

The case of *idiopathic* night-blindness recovered under treatment. The effect of treatment on acute malarial retinitis is, in my experience, satisfactory—whether there occur relapses or increased liability to some of the two forms of slowly progressive degeneration of the retina I am not prepared to say. As regards the treatment of *retinitis pigmentosa* and *retinitis pigmentosa sine pigmento*, which constitute the very vast majority of the cases of night-blindness, in my opinion not one of the "specifics" for night-blindness is of the slightest use. Until we find some means of curing, or even of delaying, the progress of similar nerve degenerative conditions in other parts of the body, I see no hope for *retinitis pigmentosa* and *retinitis pigmentosa sine pigmento*. The slow progress of the disease constitutes it a field in which the quack flourishes.

Observations on treatment, which do not give the retinal condition, are absolutely worthless, as are also observations on treatment, which do not extend over a considerable period of time in each case. The facts related in the cases require no comment here—they speak for themselves. Consanguinity had no apparent connection with night-blindness in my experience.

CASES

Retinitis pigmentosa sine pigmento

1. Ghulam Ali, æt 35 years, male. Had fever and an eruption a year ago. Treated by bleeding from the arm. Ten days after (he had only one eye) he noticed slight failing of sight at night, which has steadily increased since. Ophthalmoscopic appearances. Slight degenera-

* We invite opinions on this point. In our experience (in Bihar) night-blindness was common among prisoners in the autumn or after the period of intense heat and glare before the rains. These patients had been well fed, but they all rapidly recovered when given Liver or Cod liver oil.—E.V., I.M.G.

tion of the retina, no appearance of syphilis in the eye or elsewhere.

2 Pir Din, male, æt 9 years Had good vision until five years ago, when he had severe fever for a month (malarial) Immediately after the fever he was noticed to be night-blind, which steadily progressed Ophthalmoscopic appearances Advanced progressive degeneration of the retinae.

3 Kamul, æt 12 years, male Eight years ago he had fever (malarial) for three weeks, on the disappearance of which night-blindness set in, and has steadily progressed since Ophthalmoscopic appearances Progressive retinal degeneration.

4 Nand Ram, male, æt 25 years Night-blindness set in five years ago immediately after three weeks' severe fever (malarial) Night-blindness set in and steadily progressed since Ophthalmoscopic appearances Advanced progressive retinal degeneration

5 Raji, female, æt 23 years Had severe fever (malarial) four years ago On recovery she went out to pick cotton and observed failing sight, which was very marked at night, and in a few days she was practically blind Ophthalmoscopic appearances Advanced retinal degeneration

6 Ramji Sat, adult male Seven years' steadily progressive night-blindness Commenced immediately after severe fever (malarial), and which he attributes to the condition Ophthalmoscopic appearances Progressive retinal degeneration

7 Bhagwani, female, æt 25 years Slow and steadily progressive night-blindness, distinctly traced to origin, immediately after severe malarial fever Ophthalmoscopic appearances Progressive retinal degeneration

Retinitis pigmentosa

1 Budha, male, æt 14 years Had severe malarial fever for a fortnight, about three years ago, immediately after which it was noticed that vision was failing at night, and it has steadily progressed till the present time, when he can only recognise day from night History very definite Ophthalmoscopic appearances Advanced *retinitis pigmentosa*

2 Harnam Singh, male, æt 26 years Night-blind five years No satisfactory history of a cause Ophthalmoscopic appearances Well-marked *retinitis pigmentosa*

3 Hua Lal, male, æt 46 years Twenty years ago he noticed night-blindness, which steadily progressed until he can now only recognise day from night No satisfactory history of a cause Ophthalmoscopic appearances Advanced *retinitis pigmentosa*

4 Sham Singh, adult male Night-blind for the past ten years No satisfactory history of a cause Ophthalmoscopic appearances *Retinitis pigmentosa*

5 Sadanand, adult male Night-blind for the past 25 years No satisfactory history of a cause Ophthalmoscopic appearances Advanced *retinitis pigmentosa*

6 Kathu, adult male Night-blindness gradually progressive for the past ten years, very good vision at present—daylight No satisfactory history of a cause Ophthalmoscopic appearances Well-marked *retinitis pigmentosa*

Idiopathic or starvation night-blindness

1 Munshi Khan, male, æt 30 years For the past three years he becomes night-blind in his left eye in the spring and summer, and gets all right in the autumn and winter His right eye does not become affected He is physically below par Ophthalmoscopic examination shows nothing abnormal, except slight congestion of the disc and slight blurring No history of appearance of syphilis

Eclipse blindness

Two cases of eclipse blindness came under my observation Ophthalmoscopic examination revealed nothing except a general retinal haze which was so slight as to be hardly appreciable,

Malarial retinitis

1 Imam Din, adult male Four years ago he lost his sight suddenly in severe malarial fever, with vomiting, which lasted for 1½ years Ophthalmoscopic appearances Atrophy of both retinae

2 Fatma, æt 5 years Had severe fever for 20 days, after which it was noticed she was stone blind. After a short time blindness became partial At the time of examination the retinae presented the usual appearance of *retinitis pigmentosa* advanced If this case had been milder in its progress I think it would have been an ordinary case of night-blindness

3 Fasheram, male, æt 16 years Had severe malarial fever a month before examination, and on getting better it was noticed that there was a considerable diminution of vision There was no night-blindness as distinguished from day-blindness On ophthalmoscopic examination, there was nothing abnormal, except that the discs were paler than usual Treated with strychnia and quinine there was a rapid improvement, but I have doubts as to whether it will endure

WOUND OF ABDOMINAL WALL—HERNIA OF ENLARGED SPLEEN—PARTIAL SPLENECTOMY—RECOVERY

By F NORMAN WHITE, M B (LONDON),

LIEUT, I M S,

Civil Surgeon, Chakdara, N-W F P

THE almost unique nature of the accident and its attendant train of symptoms, the somewhat unusual line of treatment that had to be followed, and the uneventful recovery, appear to me to make the following case worthy of record.

The patient, a man of about 22 years of age, a Gujar, residing in a village in Dui, was entertaining his guests on the occasion of his sister's marriage. An altercation arose between him and one of his guests, during which the patient was shot by an old muzzle-loading gun, at a range of about one foot. Luckily, the gun was only loaded with powder and a wad at the time. The immediate result of the accident was a very severe and serious wound of the abdominal wall. For a time the patient was unconscious. He was put to bed, and during the whole of the night following the accident he suffered acute abdominal pain, and vomited profusely. The vomit consisted of bile-stained fluid. As a result of the excessive strain due to the continuous vomiting, the patient states that his viscera began to bulge out of the wound.

A dressing, consisting of the inevitable chicken's skin, was applied, and his friends, carrying the patient on a charpoy, started on their four days' march to the Chakdara Dispensary.

I first saw the man five days after the accident had taken place. Considering the severity of the local lesion, the patient's general condition was remarkably satisfactory. One-and-a-half inches above the umbilicus, just to the left of the middle line was a large, irregularly oval, jagged wound with sloughy margins, involving all the coats of the abdominal wall. This rent was about three inches in diameter and through it a firm spherical fleshy mass protruded. This mass, somewhat larger than the clenched fist, was covered with granulations and bathed in pus, which welled up from round the base of the tumour where there was some attempt at a pedicle.

This pedicle was fixed to the body wall by a few delicate peritoneal adhesions. There was no general peritonitis, but for a considerable area around the wound the skin of the abdomen was red and acutely tender. The tumour was dull to percussion, the dulness being continued up into the splenic region. The patient stated that for two years past he had had a very large spleen. An anæsthetic was administered and a more careful examination made.

It was then discovered that the tumour was solid, bled furiously when incised, and was the seat of several small abscesses.

It was obviously a portion of a much enlarged spleen that had herniated through the abdominal wound. The treatment indicated appeared to me to lie between the total extirpation of the spleen or removal of the herniated portion of that organ. I decided on the latter course, being guided in my decision firstly, by the foul condition of the wound and the consequent inability to insure against general peritoneal infection, secondly, by the reflection that half a spleen is better than no spleen at all. The chief danger of the procedure of partial splenectomy that I adopted, lay obviously in

the possibility that the multiple abscesses were not confined to the herniated portion of the organ.

Breaking down a few adhesions in the neighbourhood of the wound, I came to more or less healthy-looking tissue. I transfixed the organ with a pedicle needle and ligatured it with interlocking silk ligatures. The whole estimated portion of the viscus was then extruded. The stump was left anchored at the bottom of the wound which I made no attempt to close.

The temperature was raised for four days after the operation, and on the fourth day a small portion of the stump distal to the ligatures began to slough. I removed the sloughing portion together with the silk ligatures, trusting to peritoneal adhesions to retain the spleen *in situ*. The subsequent history of the case is one of uneventful recovery.

The wound rapidly granulated up and contracted, the scar left is a sound and remarkably small one. At the present time the patient looks and feels quite well. No spleen can be detected on palpation. The splenic dulness is normal on percussion, and there is a resonant note between the spleen and the scar. Adhesions have apparently stretched and what is left of the spleen has regained its normal position. Convalescence lasted five weeks.

The portion of the organ removed weighed three ounces. A microscopic examination of the tissue was made for me by the Kasauli Laboratory who have kindly forwarded me a specimen. Their report leaves no room for doubt as to the splenic nature of the tumour.

It is interesting to find the spleen, an organ that has gained for itself, when enlarged, such an unenviable notoriety in all injuries to the abdomen, playing such a useful rôle as it did in this case. Without doubt it was the main factor in preventing the onset of general peritonitis, so effectually did it block the wound. Why the organ did not rupture I am at a loss to understand. It must have been of softer consistency than the usual "agne-cake," otherwise it could hardly have bulged out of the wound in the way it did.

A CASE OF BOTH KIDNEYS ON THE RIGHT SIDE WITH TOTAL ABSENCE OF KIDNEY ON THE LEFT SIDE (WITH ILLUSTRATION)

BY LALMOHON GHOSHAL,

ASST SURGEON,

Teacher of Pathology, Campbell Medical School

NAME, Tarangini, age, 30, sex, female, disease for which admitted—dysentery. She was admitted into the Campbell Hospital as a case of dysentery and died two days after admission. A *post-mortem* examination was held

as usual, and the cause of death ascertained to be dysentery

When examining the abdominal viscera, the left kidney could not be found, while on the right side two distinct kidneys were discovered. It was first thought that most probably the left one was displaced, due to rough handling during the *post-mortem* examination, but on careful search it was found out that they were embedded in their positions.

Position of the kidneys—They are situated one above the other in the lumbar region, the upper one being a little closer to the liver than normally. The two kidneys were separated from each other only by loose connective tissue, the upper one is rather obliquely situated and is the kidney which should have been on the left side in a normal body.

The upper one has exactly the shape of a normal kidney, while the lower one is rather spheroidal. They are both granular and present minute cysts on the surface. The upper one is provided with a normal supra-renal capsule, while no trace of the capsule could be found, after careful search, on the lower one (right).

The hilum of the upper kidney is normal in position, but the hilum of the lower one is situated rather on the anterior surface. Two distinct ureters lead to the bladder, one from each kidney, but the upper one was closely connected, though not adherent, with the lower one by a strong band of connective tissue at about $1\frac{1}{2}$ inch below its emergence from the hilum. The upper ureter passes behind the lower kidney. The strong band of connective tissue has been separated during dissection. The ureters follow a straight course and enter the post and lower part of the bladder, the upper one opening one inch above the lower.

The relation of the renal arteries and veins is normal in the upper kidney, but in the lower one the artery reaches up to the middle of the anterior surface where the ureter emerges. The vein enters this kidney at its upper border.

These conditions are all shown in the dissection (which is preserved in the pathological museum of the Campbell Medical School). Photographs of the case are also sent.

No trace of kidney or any rudimentary representation of the kidney was found on the left side. Two arteries situated $\frac{1}{2}$ inch above the normal position of the corresponding renal arteries are seen, and they seem to be part of the mesenteric arteries.

Ovary—One on each side.

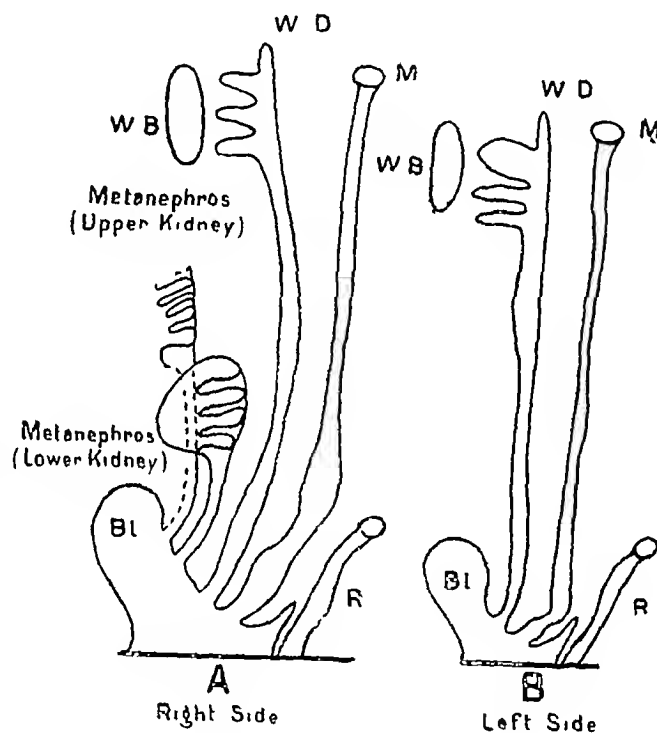
Uterus and Vagina—As in normal individuals.

Interest—Anatomical—I consulted such books as Quain, Cunningham, Grey, Ellis, &c, to find any similar description, but unfortunately I was disappointed, although Quain mentions of "occurrence of additional kidney as extremely rare" and that "sometimes two united kidneys

are situated on one or other side of the vertebral column in the lumbar region," but he does not mention of two distinctly separate kidneys on the same side. The case is unique of its kind.

Embryological—From the embryological point of view it is very difficult to explain the growth and complete development of the left kidney on the right side, especially as the other parts of the genito-urinary system were normally developed.

It can only be explained, if we suppose that two metanephros originated from the lower end of the same Wolffian body, while the metanephros of the other side did not grow at all or was obliterated. The two metanephros formed the kidneys and then ducts, the ureters. These will be evident from the annexed diagrams.



The diagram A represents how the two metanephros grew from the same Wolffian body. The lower one represents the original metanephros, while the dotted one represents the metanephros for the second kidney.

The diagram B is represented as having no metanephros at all.

This is the explanation that can be suggested. Any other explanation will be welcomed. That of a wandering kidney fixed is not impossible.

Clinical—(1) The patient grew of age without experiencing any difficulty whatever.

(2) Granular condition of the kidneys may be explained to be due to age.

(3) She died of quite a different ailment.

Lastly I have to thank our learned Superintendent, Lt-Col J H Tull Walsb, for his kind permission to publish the case and for his important suggestions.

A CASE OF RECURRENT APPENDICITIS, OPERATION AND RECOVERY

BY B C SANYAL,
ASST SURGEON,
Bulandshahr

ON the 16th of September last, I was called to see a case in the neighbouring village of Gulaothi. The patient, a Mahomedan, æt 47 years, a Sub-Inspector of Police of the Saharanpuri District, was described to me to be suffering from 'intense colicky pain in the abdomen.'

On examination I found the patient in the following condition:—

There was high fever with a temperature of 105°F, tongue, coated with a thick creamy fur, bowels, constipated, heart and lungs, in normal condition. The patient was quite conscious.

There was a marked tense swelling in the right iliac fossa, dull on percussion, with constant pain of a throbbing character. There was much localized tenderness, very marked at a point about an inch and a half internal to the right anterior superior iliac spine. The right thigh was in position of semi-flexion, any attempt at extending the thigh causing agonizing pain. There was no sign of diffuse peritonitis. The patient was a robust-looking individual with good muscular development.

He gave the following history of his illness —

During the last six months he had had repeated attacks of 'colicky pain' in the abdomen not confined to any particular area, vomiting and constipation, each attack lasting for about a week or so. The present troubles began six weeks ago with the initial symptoms of vomiting, constipation and abdominal pain, of an indefinite character, at first becoming localized, subsequently to the right iliac fossa, attended with fever, which has become continuous.

He had to take leave and returned to his native village, where he was put under the treatment of hakims, who diagnosed the case as one of 'intestinal colic with constipation' and treated him with diastic purgatives.

Under my advice, the patient got himself admitted in the District Hospital at Bulandshahr on 19th September 1904.

On admission, the patient was examined by the Civil Surgeon and a diagnosis of appendicitis giving rise to a localized abscess was made. An operation was proposed, to which the patient gave his consent after some days' hesitation. In the meantime, hot boile compress was ordered to be applied continuously over the part, *internally*, Salol—gr x, t d s was prescribed, with morphia draught, p i n to combat the pain, soap water enema, or, was to be given morning and evening. All solid food

was stopped, chicken broth and jugged soup being the form of nourishment allowed.

On the 23rd of September, the patient was operated on by Captain Willmore, Civil Surgeon. Chloroform being given, an oblique incision, 2½ inches long, was made, commencing about one inch internal to the anterior superior iliac spine and running parallel with the outer end of the Poupart's ligament; the abscess cavity was reached after freely dividing the abdominal wall, which had become of a brawny consistency, and on incising it, about a pint and a half of offensive, thick, creamy pus was evacuated. Digital exploration of the abscess cavity revealed the presence of adhesions all round, shutting it from the general peritoneal cavity. The appendix was found firmly adherent and had to be left undisturbed. The abscess cavity, after irrigation with weak chinosol solution (1 in 4,000), was stuffed with long strips of gauze.

After the operation, the patient's recovery was uninterrupted, the temperature, hitherto high, came down to normal on the morning following the day of operation and remained so throughout. The abscess cavity filled up by granulation in the course of four weeks.

The history of the case is typical of what is described in text-books as relapsing appendicitis; owing to the presence of adhesions, the removal of the appendix was found impracticable—a difficulty often experienced in a case like this.

A noticeable point in the history is that the pain was not at first localized to the right inguinal region, but was of a general character, and this might easily lead to a misapprehension of the true condition present.

THE following Indian Army Order is here republished:—

"MEDALS—LOSSES.—It is notified for information that all applications for the replacement of lost war medals, should be accompanied by Army Form B 177, and an extract of finding of the Board in duplicate."

"As a tentative measure" (*sic*) Captain E. S. Clark, R.A.M.C., is appointed a specialist in specific fevers, and Captain F. Kiddle, R.A.M.C., in Ophthalmology.

CAPTAIN J. G. P. MURRAY, I.M.S., has been appointed Civil Surgeon of Jessore, and on return from furlough Major D. R. Green, I.M.S., Civil Surgeon of Mymensingh.

THE following Indian Army Order has been published:—

"LANGUAGES—EXAMINATIONS.—The Government of India have decided* that the prohibition in paragraph 981, Army Regulations, India, Volume II, against candidates appearing by the Higher or Lower Standard test within six weeks of the date of their failure, is not to be held applicable to candidates who are entitled to present themselves for re-examination in one subject only.

2. The regulation above quoted will be amended accordingly in due course."

CAPTAIN G. E. CHARLES, I.M.S., is posted to the officiating medical charge of the 5th Light Infantry.

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SEPTIC TANK INSTALLATIONS IN
BENGAL

THE Committee appointed by Government to report on the working of the existing septic tank installations in Bengal, and on the means to be adopted to render the system efficient and free from objection has submitted their provisional report. The Committee consisted of the following—Colonel S H Browne, CIE, IMS, Inspector-General of Civil Hospitals, Bengal, President, the Hon'ble Mr D B Horn, Secretary to Government of Bengal, P W D, Major F C Clarkson, IMS, the Sanitary Commissioner, Bengal, with the Hon'ble Mr L P Shree, Financial and Municipal Secretary to the Government of Bengal as Member and Secretary. The instructions given made special reference to the septic tanks in the mills on the banks of the Hooghly. The Committee made exhaustive inquiries and have now submitted their report, provisional only in that the observations for the purpose of ascertaining the fresh-water flow of the Hooghly River in the dry season have not yet been concluded, and because the experiments as to whether the effluent can be bacteriologically purified by filtration through sand filters have still to be carried out.

The conclusions of the Committee are interesting and practical. The effluents from the tanks examined were found to be slightly opalescent fluids containing no perceptible solids, in some cases giving off a faint odour of sewage. They were non-putrescible. The chemical analysis of the effluent from the Gournipur Mill was considered by the Chemical Examiner to be satisfactory, but the results as regards the proportions of nitrates and albumenoid ammonia do not come up to the standard of similar analysis in England. The bacteriological examination was done both by Dr N Cook, the Health Officer, Calcutta, and by Captain L Rogers. They agree in showing that there is considerable bacterial contamination of the river water near the outfalls of these effluents, although this was found to have largely disappeared in the immediate neighbourhood of the Pulka intake.

The important question as to the extent to which pathogenic micro-organisms survive the struggle in the septic tank has been investigated by Major F J Drury, IMS, and Captain L Rogers, IMS. It is found that while the process is inimical to some organisms others survive, so that the effluents must be considered potentially dangerous. This opinion agrees with that of Dr Houston, the Bacteriologist to the London County Council, and with the opinions expressed by the Royal Commission on the disposal of sewage, in fact, "effluents from bacteria beds ought to be regarded as hardly if at all more safe in their possible relation to disease than the raw sewage before treatment."

The extent of pollution, however, depends not only on the character of the effluent, but also upon the rapidity with which further oxidation is produced and bacteria are destroyed through contact with river water and by the action of the air and sun.

The extent to which sewage effluents are diffused and purified in rivers has been carefully investigated in regard to the River Thames, by Professor Clowes and Dr Houston, and we agree with the Committee in considering that their observations justify the belief that in the case of the Hooghly "any pollution caused by the discharge of septic tank effluents into it must disappear very rapidly."

From a consideration of the facts and observations set forth in this report, we are of opinion that the Committee were well justified in the following statement which we quote *in extenso*—

"They are deeply impressed by the great advance in Sanitary Science which is represented by the septic tank system, and they consider that the replacement of the old insanitary latrines by septic tank installations has effected a marked improvement. The existence of great pollution in the past does not justify the continuance of any pollution in the present or in the future, but nevertheless the fact is of practical importance that the stoppage of the present system would probably increase rather than diminish the pollution, and it will therefore be a misfortune if some means cannot be found of overcoming the objections to the use of these tanks. The chemical composition of the effluent may be brought by suitable improvements up to the standard attained in England, and will then be open to no serious objection. The only danger which needs to be considered is that arising from bacteriological pollution. During the greater part of the year when there is a large and rapid outflow of the Hooghly this pollution in all probability rapidly disappears, and produces little, if any, effect on the drinking water supply of Calcutta and Howrah."

Moreover, this supply is filtered by the Municipal authorities, and after such filtration the danger is no longer appreciable. The action of Government must, however, be determined not by the minimum, but by the maximum pollution during the year, in other words by the pollution during the dry months. The volume of water coming down the river is then more nearly comparable to that of English rivers, and in view of the results obtained and the opinions expressed by Dr Houston and by the Royal Commission on Sewage Disposal, the Committee feel that they have no option but to acquiesce in the decision that effluents which are not subjected to bacteriological purification are potentially dangerous if discharged into a river whose water is used for drinking purposes. Their conclusion therefore is that the effluents should not be emptied into the river above the water works, or so near the water-works as to affect the water supply. The precise point below Pulta at which a line should be drawn cannot be stated until the observations on the ebb and flow of the tides have been completed, but for the present they recommend that the discharge of the effluents without such purification should be permitted at any point below Tolly's Nala. If it is hereafter found impossible to effect the requisite purification by means of sand filters, or if the effluents cannot be disposed of otherwise than by being discharged into the Hooghly, the question may be reconsidered, but otherwise in view of the sentimental objections which exist, and of the desirability of keeping the water of the port as pure as possible, the Committee are of opinion that the rule now suggested should be adhered to. The sentimental and religious objections to the pollution of the Hooghly have not been discussed, but it will be seen from the minutes of evidence that a difference of opinion exists regarding the latter, and the real objection appears to be sentimental rather than religious, and to be largely due to ignorance of the transformation effected in the nature of the sewage by its passage through the septic tanks. They conclude therefore that the opposition would probably subside if the real facts were brought home to the public, so that the great utility of the new system might be recognised."

The third part of the Report deals with other methods of disposal of the effluent.

Above it is seen that the Committee can only recommend the direct discharge of the effluents into the river in cases of mills situated below Tolly's Nala. In the case of mills situated above this point on the River Hooghly, there are several methods to be considered, *viz* (1) that the effluents should be run over land, (2) that the effluent should be used as feed-water for boilers, (3) that they should be bacteriologically purified through sand before discharge into the river.

At first sight to run the effluent over the land seems very simple, but in Bengal during the rainy season to do so would simply mean to run it direct into the drainage channels or the river,

as the ground is flooded to such an extent. In other parts of India and away from the Hooghly banks, where land is high-priced, we believe that use can be made of this method, but the land must be dry, and the soil must be cultivated, as the fertilizing quality of the effluent is great. The objections here, however, are that the effluent after its passage through land is not greatly, if at all purified, and the water must sooner or later reach other waters. For these reasons the Committee do not recommend the land treatment when any other methods are available. There is one use that the effluent can be put to, which is certainly effectual and has in practice in England been found unobjectionable. This is to use the effluent to feed the boilers of the mills to which the installations belong. There may be prejudice against this at first, but a six years' experience at Hampton in Middlesex has shown that there has never been any trouble with the boilers, and any objections on account of caste feeling would soon in practice be overcome.

The remaining method is to bacteriologically purify the effluent by further filtration through sand. This is a method of which we have great hopes, if successful, it will go a long way to solve the problem of the disposal of the effluent. The standard of purity required need not be greater than that of the river into which the effluent is poured, if this suffices for the city of Glasgow, as Provost Shanks of Bairhead recently stated, it may probably suffice for the towns and rivers in Bengal.

We look forward with interest to the report of the further experiments and observations of the Committee on this point, meantime the medical profession in India is indebted to them for their clear, valuable and practicable report.

AMERICAN SANITARY ENTERPRISE IN PANAMA

THE evil reputation which has clung for years to the great canal works in the Isthmus of Panama bids fair soon to be abolished by the energy, enterprise and belief of American sanitarians and the Government of the United States.

It is worth our while in India to study for a few minutes the methods of our American confrères.

If modern science can make healthy the work on this great canal, it will be the best justification

for the intervention of the States into this affair

It will be remembered that the State of Panama seceded from Columbia on November 3rd, 1903, was promptly recognised by the United States three days later

The two governments at once went on to ratify the treaty for the Trans-Isthmian Panama Canal, which was effected on 26th February 1904. Under this treaty the new Panama Republic ceded, in perpetuity, a strip of territory known as the Canal Zone, ten miles wide, extending from the Atlantic to the Pacific. The interests of the new French Panama Company were transferred to the United States on May 4th, 1904.

The States set promptly to work, and the Isthmian Canal Commission took with them as sanitary advisers, Colonel W. C. Goigas, Assistant-Surgeon-General, U. S. Army, well known for his wonderful antimosquito work in Cuba. Dr. J. W. Ross, the Medical Director, U. S. Navy, and Major N. LaGarde, Surgeon, U. S. Army. The Isthmus was well explored, and the sanitary officers submitted a report on the organisation they proposed. Colonel Goigas was next appointed Chief Sanitary Officer, with power to direct the operations of the Sanitary Department and to enforce the sanitary regulations of the Board of Health. Dr. Ross was appointed Director of Hospitals, Surgeon Carter, of the Marine Service, as Chief Quarantine Officer, and Major LaGarde, as Superintendent of the Ancon Hospital. The above three officers with the Chief Sanitary Inspector form the Board of Health.

The following hospitals are arranged: the Ancon Hospital, 500 beds, to be fully equipped as a modern hospital, and to have a good nursing service. The Colon Hospital at the Colon end of the canal is to have 300 beds, it is made up of two former institutions and will cover a large portion of the north of Manzanillo Island.

It is estimated that about 20 hospitals will be needed along the line of the canal, at present three of these have been started. In addition, dispensaries will be started at all places where workmen are concentrated, out of reach of one of the hospitals. All these hospitals are in charge of qualified medical men, taken either from the public services, or they are civilians.

In addition to this, the Canal Commission have re-organised all the previous imperfect hospital arrangements in the State, the City Hospital of

Panama, the Strangers' Hospital at Ancon, the Leper Colony at Panama, have all been taken in hand and re-organised.

Not is the even more important duty of prevention forgotten. The Sanitary Department is officered by a chief inspector and eight assistants, their work includes the supervision and direction of the destruction of mosquitoes, general cleaning, and disposal of sewage, etc. The two towns of Panama and Colon have got new health departments.

All persons coming to the Isthmus in the employ of the Commission must have medical certificates of fitness for work in that climate.

There is also a convalescent station established on Tabago Island, which was built by the French Company as a Convalescent Hospital. Here too, is a good water-supply collected in tanks and reservoirs from the mountain springs.

Major Ronald Ross has recently borne testimony to the thoroughness with which the American Government has undertaken this work, and the progress of the works under the new management of the canal will be followed with interest by sanitarians all over the world.

LONDON LETTER

THE MICROBE OF CANCER.

DR. DOYEN, of Paris, claims to have discovered the microbe of cancer which he has named *micrococcus neoformans*. He also claims to have prepared a serum which if it does not actually cure cancer, acts upon it so that cancerous tumours present a more easy and favourable subject of radical and permanent extirpation by operation. There is no mystery or concealment about Dr. Doyen's proceedings such as compromised Sanarelli's famous and futile discovery of the *bacillus veterodes*, and of a curative serum whose mode of preparation he refused to divulge, but which he offered to sell at a high price. Dr. Doyen has submitted his result to an influential committee, of which Professor Metchnikoff is a member, and the subject has been fully discussed at a meeting of the French Society of Surgery. It is reported that Doyen's bacillus is found habitually in cancerous tumours. Experimental inoculation of lower animals is said to be extremely difficult and to require further trial. The serum is reported to produce beneficial changes in the diseased parts, but a committee of five eminent surgeons has been appointed to watch

progress of the treatment Meantime Dr Doyen is being prosecuted by an American, whose wife was treated by the serum and who died during the process! The questions referred to the committee were these —1, Does the microbe described by Dr Doyen exist? 2, If so, is it undoubtedly the cancer microbe? 3, Is it unmistakably distinguishable from other known microbes? 4, Can Dr Doyen's microbe form the basis for a serum to be used in inoculation? 5, Does Dr Doyen's serum cure cancer? It is understood that an affirmative reply was given to the first four of these questions and that the committee reserved their judgment on the fifth for want of sufficient evidence which, it is expected, will be soon forthcoming

THE LEISHMAN-DONOVAN BODY

I am in a position to state that important evidence will shortly be published regarding the natural history of this organism which will shed light upon the ætiology and pathology of the disorders to which it gives origin We seem to be on the eve of great discoveries on this subject as startling and far-reaching as those which have shed so bright a light on the nature and causation of malarial infection

SANITARY HAIR-DRESSING

Dr Collingridge, Medical Officer of Health of the City of London, has presented to the Sanitary Committee of the Corporation a report on the dangers to which the public is at present exposed on account of the insanitary condition of hair-dressers' establishments, and the risks involved in the proceedings of hair-dressers Brushes and razors are used promiscuously for all comers, and infective diseases are often conveyed by these and other instruments and appliances The work of the hair-dresser is of so personal a nature that the utmost cleanliness and care are necessary for comfort and safety The best plan is obviously for customers to reserve for their own peculiar use all appliances required for hair-cutting and shaving This would give rise, no doubt, to trouble and expense, the next best system would be the thorough disinfection of scissors and razors during intervals of disuse, and the discontinuance of the indiscriminate use of clippers, brushes, &c The use of clean cotton, wool and towels for each person is already practised in most establishments, and in the higher class places, ventilation and cleanliness are carefully carried out The difficulty in procuring reform

will necessarily be greatest in places where cheap hair-dressing and shaving is done, and it is in these that the greatest risk of infection abide Dr Collingridge has collected evidence from all parts of the civilized world regarding the existence or absence of regulations affecting the business of barbers and hair-dressers In many countries such regulations exist, and the need of them all is undeniable His report has raised a very serious issue and will probably lead to registration and licensing of hair-dressers to the framing by local authorities of rules affecting their work and of systematic inspection for the purpose of securing that these shall be observed Meantime it is incumbent on customers to take such precautions as will ensure the services of the tradesman employed by them being exercised with due observance of sanitary prudence

K MOL

The 15th December, 1904

Current Topics.

"THE SPIRIT OF MEDICAL SCHOOLS"

WE desire to call attention to the following facts with regard to the marble slab on the wall of the staircase in the Medical College, Calcutta, a copy of which we reproduced in our last issue

The money was obtained for the marbles by the generosity of the Maharajah of Durbhunga and through the kindness of Sir Andrew Fraser The original translation of Hippocratic Oath was made by the Rev Dr R H Charles, Professor of Biblical Greek in Trinity College, Dublin

The whole project was initiated by and carried through by Lt-Col Charles, I MS, Professor of Anatomy at the College, and the object of putting up the marbles was to show the affinity between medical men in the east and west, to impress upon students the solemnity and age of their profession, and to be a record of the ethical ideals which should continually be before the minds of medical students

LARREY, THE IDEAL MILITARY SURGEON.

UNDER the above title Dr J C Wise, Medical Director of the United States Navy, read his address as President of the Association of Military Surgeons of the United States

Larrey was born in 1766, in a village in the Hautes Pyrennees, after leaving school he was apprenticed to an uncle a surgeon at Toulouse Larrey afterwards went to Paris to try to get in appointment in the Navy Service He soon passed the newly prescribed examination and

was appointed Surgeon on the Ship *Vigilante*. He made his mark on his first voyage and was on return sent to Paris, where he started under the celebrated Desault to re-organise the ambulance. In 1792 he was transferred to the Army and joined the Army of the Rhine, and from that date to the fall of Napoleon, Larrey was almost continually on active service. We quote now as follows from Dr. Wise's article —

In speaking of Larrey's plan, General Ambert writes "It was not only a surgical system that Larrey had invented, it was a veritable military organization which lent itself to strategic combinations as well as to administrative exigencies. He had combined the sanitary service in such manner as to place it in relation with the admirable divisional order of our armies. Larrey multiplied his units, without modifying their composition. A few hours thus sufficed to assure that important branch of the service, on the other hand, the division sub-divided into brigades or demi-brigades for secondary operations." While engaged in this important field work Larrey found time to investigate the phenomena of galvanism, and to send an able and valuable report to the French Academy on gunshot wounds.

He was promoted and won from Beauharnais the highest encomiums on the results of his work, and the statement that his "indefatigable labors in the care of the wounded had contributed to the cause of humanity and the country."

On returning to Paris, he is directed to organize the ambulance system for all the armies of the Republic, and on the completion of this service, he is ordered to the school of Military Medicine at Val de Grâce as Professor of Surgery. In 1795 he served with the Army of Italy. Napoleon on seeing the splendid work of his "ambulances volantes," thus addressed the famous surgeon "Your work is one of the happiest conceptions of our country."

In May 1798 Larrey embarked as Surgeon-in-Chief of the Expedition to Egypt.

The services of this officer, in this most celebrated campaign, is a complete history of the duties of the military surgeon. To give in detail the story of Larrey's work in Egypt and Syria, would be but to write the history of those campaigns, he was in every battle, in defeat as well as victory. At all times we figure him as the genius of mercy with outspread wings and sheltering arms, carrying succor and surcease of sorrows wherever he went. To day he is experimenting to find the causes and an efficient therapeutics, for all prevailing ophthalmia, to morrow with other "Officiers de Sante" defending the Military Hospital at Cairo from attack, and let those who call medical officers "non-combatants" note that on this occasion, two of Larrey's staff, Roussel and Mangin, fell mortally injured at his side, in defence of the wounded,—but we read "the sick were saved." In Syria, Larrey literally lived among the sick and wounded, establishing at every convenient point well organized hospitals, he sent to them with miraculously swift transport, those incapacitated for duty at the front. It is in this respect that Larrey probably evinced his greatest genius as a Military Surgeon,—he conceived correctly the requirements of the situation from the sanitary standpoint, and his intelligence and success in fulfilling these conditions for the best disposition of the sick and wounded on the field of battle, are unequalled, yet while discharging administrative duties on this grand scale, he performed daily hundreds of capital operations, thus realizing our highest conception of administrative and professional talent.

The Army of Bonaparte was attacked in Syria by the plague, and when we reflect on the status of our knowledge of the disease in this enlightened age, we can but reflect how much worse were the conditions in Larrey's time. He fought the pest heroically, as we would expect of him, and with every means known to the science of

his day, but to see eight of every ten cases die, yet undaunted he relaxed not in his ministrations. Of thirteen hundred wounded embarked from Egypt for France, we are told there were but eight deaths, with unrelaxing care, and attention to ordinary methods of cleanliness, Larrey obtained as good results on this occasion, as we now have, with antiseptics.

Just as we find Larrey in Egypt, so he is elsewhere; we note the same unalterable devotion to duty, the same great humanity and supreme pity, the same self-command, the most intense love for scientific observation, combined with these qualities, he possessed an exalted courage in disaster, a spirit so high, a resourcefulness so inexhaustible, as to command not alone the respect, but the reverence of the Army, as well as that of all Europe.

Returning to France Napoleon made his great surgeon Chief Medical Officer of the Guard, and pinning upon his breast the insignia of the Legion of Honor, the First Consul said to him "C'est une recompense bien meritee."

Is it not a worthy tribute to the brotherhood of our noble calling, that after Napoleon's army entered Berlin Larrey was made a Doctor of Medicine of the University of Jena? Thus his enemies rewarded him.

After the arduous campaign of 1808 in Spain, Larrey's health failed, no physician could elaborate the resources he required of it. He contracted typhoid in treating an epidemic of this disease among English prisoners.

After a leave spent in Paris, thanks to his vigorous constitution, he is soon well again and able to rejoin the Emperor before Vienna in 1809, here, as at Berlin, he is crowned with highest honors and delivers a course of lectures on Military Surgery. He had practiced surgery on every battlefield and so he taught this science in every conquered capital, receiving no guerdon but the unanimous applause of a civilized world.

His work in reorganizing the hospitals in Vienna was enormous, one day while thus engaged a parchment was placed in his hands. Napoleon named him a Baron of the Empire, with an annuity of 5,000 francs.

To us, gentlemen, this was his most inconsiderable monument.

In 1812 Larrey was named Surgeon-in-Chief of the Grand Army. Desgenettes, his old friend in Egypt was *Medecin-en-Chef* and together they labored to make preparation for this most formidable armada, to day we cannot conceive of it, for being one of the most immense mobilizations of modern times, it was at a date prior to steam transportation, anaesthesia and antiseptics, but Larrey had set about a task as impossible as that of Napoleon. At the outset, ambulances were in insufficient number for the care of the wounded.

The Surgeon-in-Chief sacrificed his own conveyance to no purpose. At Smolensk the most ordinary surgical supplies were wanting, and Larrey left here 10,000 wounded, and all his reserve staff flaming villages, and death dealing cold was all prevailing,—no medicine nor dressing, no food or transport! Such was the situation of the French army, even before the battle of Moscow, September 7th, 1812. Larrey's great soul viewed with intense calm and profound sorrow the inevitable outcome of such a situation.

At the end of this September day, there lay upon the field, of the French, forty general officers and twenty-nine thousand men killed and wounded while on the Russian side the loss amounted to sixty thousand!! Such slaughter is almost incredible.

The devotion of the French medical staff, which labored day and night, amidst great privations, on friend and foe alike stands to day as a most sublime tribute to our profession.

The historian of the Empire, M. Thiers, quotes Larrey as the most reliable authority at the capture of Moscow to the effect that the Army could have existed six months on the provisions captured there.

Such a spirit as Larrey's could not be crushed in the despair of this famous retreat

General Ambert tells us "the ambulances marched in the centre of the column, surrounded by surgeons who, sustained by the attitude of Baron Larrey, lavished their care on the sick and wounded. On all sides they called on Larrey, who marched in front carrying succor and encouragement wherever he went, placing his gourd to the lips of the dying and dividing his crust with those left behind. No circumstance shows the indomitable courage of the man better than temperature observations, taken with an instrument carried attached to the lapel of his coat, such was a spirit which animated Ambler, writing his journal with freezing fingers in the Arctic

At the passage of the Beresina with fifty thousand souls crowding two small and insecure bridges, their rear galled by the Russian fire, Larrey's life was saved by the soldiers, who taking him in their arms passed him from one detachment to another

After the battles of Lutzen and Bautzen it was reported to Napoleon that many conscripts mutilated themselves in order to escape further military service, the mutilations consisted of wounds of the hand, or a loss of fingers, making it impossible to handle arms. The Emperor's indignation was beyond all bounds, he considered the honor not only of the army, but the nation at stake. Larrey, who had examined many of the wounds, declared that they were not voluntary. Napoleon then ordered an official inquiry in each case, and so important did he consider a correct solution, that the Court was composed of officers of the highest rank

Larrey's plan was to inquire minutely into the circumstances of each case, the character of the injury, and how it was received, as would be done in any medical legal procedure,—thus making the task long and laborious. It was established, that most of the wounded were young conscripts unfamiliar with arms, who were invariably from the front rank, being shot by those in the rear, others it was shown had been wounded when scaling hills and holding their pieces in front of them

Thus Larrey was looked upon as the conservator, not only of the lives of his comrades, but also of their honor. He was as well known among the men as the Emperor himself, and was always welcomed with him

The great drama in which these two remarkable men, Napoleon and Larrey, had so long and brilliantly acted drew near to its close. Larrey, as we would suppose, wished to follow the Emperor to Elba, but he was denied this last and extreme test of fidelity, his sovereign telling him, "You belong to the Army, you must follow it." Yet they met again on the fateful field of Waterloo, where Larrey's ambulances were dispersed by a charge of cavalry

As we would expect of a nation, whose civilization was so much in advance of all Europe, the humane side of war was early recognized in France, yet the efforts at relief of the wounded were seldom, if ever, extended to the enemy, and indeed, a "service de santé" in its full meaning and import can be said to have originated in the Army of the Rhine, under Beauharnais, being conceived and consummated by Baron Larrey. The service for surgical assistance had hitherto been rather an annex to the military family of some great commander, thus Vesalius, served with Charles V, and Ambroise Paré was attached to the camp of Vendôme. If we speak of Military Surgery in its truer sense,—that rendered on the field of battle, and in military hospitals involving also the collection and transport of the wounded—we do not hesitate to name Larrey as its creator. If any doubt the truth of this assertion, let them compare Paré at the siege of Metz, under the Duc de Guise, with Larrey at Vienna with Napoleon. At Metz there were neither hospitals nor surgeons, and the military authorities cared so little for the wounded that as the current phrase put it, "the bed of honor of the wounded is a good ditch." The "service de santé" of Larrey comprised not only all that is fully comprehended in

the words to day, but it had at its head a man so greatly gifted with administrative capacity and practical surgical qualifications combined, that it can be truly said, no age before or since has produced his equal. As Ambert says of him, "Larrey was a complete Army Surgeon—he was the first of his race. Until his day the grandeur and importance of the surgery of armies had been ignored. Not only did he organize the service, but he elevated it to the height, that Napoleon elevated the edifice of his military power. He had the intrepidity of the trained Captain, the secure probity of the honest administrator, the ardor and activity of the simple soldier, and the humanity of a father, besides a goodness and simplicity that made him beloved by all, and a virtue which commanded universal respect. Ambition was a stranger to him, he disdained fortune, and lived in the midst of the Grand Army as a man apart. He was also General in Chief, he had his Army, that he commanded and manoeuvred. At the sight of the enemy Larrey made his dispositions, his 'avant grade' penetrated afar to find the wounded, his line of ambulances is a battle corps with attending reserves

"This army which conserves is made in the image of that which destroys. He places an ambulance here and dispenses one there, according to the new position taken by the combatants. He measures the development of the battle, considers, in turn, the artillery, the accident of the field, the depth of the columns, and collects the dead and wounded. He takes no account of rank or nationality, but has for all words of encouragement, and is sufficiently master of himself, to preserve even under the mitrailleuse, sweetness, benevolence and charity. Never did Larrey neglect to plough the field abandoned by the enemy and, collecting the wounded as brothers, prove to them that, if France is great in her courage, she is also great in her humanity." Such is the man I would present to you as the highest ideal for us to follow, such in his absolute human completeness, is the surgeon, the soldier, and the gentleman

In the contemplation of a career such as this, we must admire it as a whole. It is not his devoted efforts to succor the plague stricken in the deserts of Syria, it is not the majestic nobility of his example or his heroic self sacrifice amid the rigors of an arctic winter in Russia, it is not his loyalty which saved the honor of the army at Bautzen, it is not the administrative capacity, which organized the first "service de santé" in the field, as well as the hospitals of fallen capitals, before whose walls he had a few hours before performed hundreds of capital operations, nor is it for his fidelity at the last,—but it is rather for all of these things, combined with a nature so gentle, a humanity so unfathomable, that makes the character of the splendid Larrey, and marks him as one—

"Cast in the majestic mould
Of those high statured ages old"

As worldly rewards go, this man was requited. Every court and academy in Europe vied to do him honor, but he loved best, we are assured, the mute yet eloquent look which told of pain relieved and suffering assuaged

At Val de Grâce, the French school of military medicine where he lectured, they have placed a monument to his character and services, his name has been written high upon the arc de triomphe de l'étoile, yet those who most love and revere his life and example, will find his fitting memorial in the shaded walks of Père la Chaise, where on the stone which marks his resting place are the words, taken from the will written at Saint Helena

"The most virtuous man I have ever known"

THE EGYPTIAN MEDICAL SCHOOL

We have received the second report on the Egyptian Government School of Medicine, which contains ten articles on medical and surgical subjects of much interest

The first article is by Dr W H Wilson, M B (Oxon), the Professor of Physiology, and deals with the venoms of scorpions, three of which are particularly common in Egypt. It was not found possible to induce the scorpions to eject their poison into a watchglass, so Dr Wilson devised a method of squeezing out the venom from the bulbous portion of the sting which is contained in the last joint of the tail. We may briefly summarise some of the conclusions arrived at by the writer, (1) the venom is a clear viscid fluid with about 20 to 28 per cent of solids. Proteids form the most important constituent. The venom differs in the different species. The active principle is soluble in glycerin, but not in pure water, and is unaffected by drying. The symptoms produced in animals are referable to the muscular and glandular tissues, and are due to the direct exciting action of the poison on the contractile tissue, death is due to the inability of the respiratory muscles to respond to stimuli reaching them from the central nervous system. Intravascular clotting does not occur. Certain animals, the desert rat, the Fennix fox, the zenilla (*ictomys libyca*), and the hedge-hog appear to be immune to scorpion sting.

Another article in this Report is by Dr Llewellyn P Phillips, M D F.R.C.S., on the rôle played by malaria in the production of ascites, which we notice separately. Mr F Cole Madden, F.R.C.S., has a paper on four cases in which he performed double oophorectomy for inoperable cancer of the breast. The results, though not at all satisfactory as regards cure of the cancer, seemed to Mr Madden to have to some extent prolonged life.

Mr Madden has also another valuable article on some unusual manifestations of bilharzia. He gives the following cases: (a) spontaneous disappearance of a bilharzia tumour of the bladder after an exploratory cystotomy, (b) bilharzia of the transverse colon with secondary infection of the peritoneum and mesenteric glands. Mr Madden notes that though bilharzia of the lower bowel is common, it is rare to find this in the upper portions of the colon, except in what is called "bilharzic dysentery," where the ulceration is due to ulceration following on necrosis of bilharzia papillomata. Other cases are also detailed and well illustrated of bilharzia of the female genitals. It is also noted that it is not altogether unusual to find the living adult worm in bilharzia tissue.

On the whole a perusal of the literature of bilharzia disease should make us thankful that it is not one of the diseases endemic in India.

Dr W St C Symmers writes a note on the *post-mortem* examinations at the Kasr-el-Aini Hospital, Cairo. We note that out of 460 autopsies only two cases of waxy disease were found. Is not this form of degeneration also rare in India? There were fourteen cases of liver abscess examined: the abscess was single in nine instances, and only four were "associated with dysentery," as the usual but vague term is. There

were only eleven cases of cancer found. Three cases of "splenomegaly" were decided to be cases of Banti's disease. The ankylostoma worm was searched for in all cases in the bowel, but only discovered in 38 cases: seven of these are put down as deaths from "pure ankylostomiasis." We note that the most recent communication of Dr Loos is that ankylostomes are "certainly not blood suckers." We would like to see the evidence on which this revolutionary dictum is based. The paper of Dr Tiibe on phthisis in Egypt will be noticed separately. There is also an interesting article by Dr G P G Sobhy on certain modern Egyptian superstitions about pregnancy and child-birth, another valuable note on bilharziasis by Mr Milton, and the volume concludes with an able and valuable study of the morphology of the brain with special reference to that of Egyptians.

The whole volume is a record of the admirable work carried on in the Egyptian School of Medicine.

THE CAUSES OF ASCITES

In the report of the Egyptian Medical School which we have above reviewed is a valuable article by Dr L P Phillips, on the rôle played by malaria in the production of ascites. The following remark which introduces his article is largely applicable to India:—"On visiting the medical wards of the Kasr-el-Aini Hospital one is struck by the larger number of cases of ascites undergoing treatment, this is all the more noteworthy when it is taken in conjunction with the fact that alcohol is but little drunk, save in the large towns, the bulk of the population being Moslem." Dr Phillips has found that the proportion of cases of ascites to all form of disease for which patients were admitted is 1 in 90.

Since ascites is a symptom of disease of the heart, the lungs, the kidneys, the peritoneum, the liver and the spleen, it is necessary to differentiate the cause in any particular case. The organs of most importance in the causation of this disease are the liver and spleen, and even here we have to consider the many varieties of cirrhosis of the liver, malignant disease, syphilitic, alcoholic, bilharzial, and malarial. We purpose here only to follow Dr Phillips in his consideration of cases which may be or have been ascribed to malaria.

The evidence in favour of malaria is given by Dr Phillips in three categories, (1) blood examination, (2) *post-mortem* evidence, and (3) the history. We note that it is not considered that the blood examination has yielded much evidence, "for," says Dr Phillips, "the cases are those in which the active infection has passed, and in these cases it is at all times difficult to find any parasites in the peripheral blood, and I personally do not consider it justifiable to puncture the spleen, so the splenic blood was not examined."

This, we think, is unfortunate, as in view of the recent work on the Leishman-Donovan bodies, it is of the greatest importance to know to what extent this infection is responsible for ascites, as it is nowadays considered that many, if not most cases of enlarged spleen are due to this infection.

Dr Phillips concludes his analysis of the 100 cases examined by giving the following table which we may reproduce, as the causation of ascites is a matter of the greatest importance to us in India, as evidenced by the enormous numbers of patients treated for this symptom in our hospitals and dispensaries.

"Ascites in Egypt is due to the following diseases in about the percentage stated —

- (1) Diseases of the heart, 4, possibly 7 per cent
- (2) Diseases of the lungs, 3 per cent
- (3) Diseases of the kidneys, 8 per cent, possibly 9 per cent
- (4) Diseases of the peritoneum, 3 per cent
- (5) Diseases of the liver and spleen 78 per cent

If the later group be sub-divided we find that there occurs —

- (a) Malignant disease of liver, 5 per cent of the whole
- (b) Syphilis of the liver, 1 per cent of the whole
- (c) Alcoholic cirrhosis, 8 per cent of the whole
- (d) Bilhizial cirrhosis, 1 or 2 per cent of the whole
- (e) Malarial disease of liver and spleen, 30 per cent of the whole
- (f) Doubtful cases 32 out of 100, which possibly as many as 22 were almost certainly malarial"

The question is an interesting one and one deserving of study in India from the point of view of the Leishman-Donovan body infection.

THE POSITION OF PHTHISIS IN EGYPT

UNDER the above title Dr Tribe discusses the question of the prevalence of tuberculosis of the lungs in Egypt. In that country the question is a most important one, for "from many years past Egypt has been considered one of the chosen spots of the earth for the sojourn of sufferers" from this disease. The question naturally arises, to what extent is tubercle of the lungs a disease of the natives of Egypt. It is by no means rare, by no means uncommon, but further analysis shows that hospital patients are derived from three different classes: (1) the real native population of Egypt, (2) the Berberines, and Soudanese who form a large proportion of the domestic servant class, (3) cases among the very large permanent European colony in Cairo and its vicinity. Now it is shown that more than half the cases are found among the two last classes, and the native Egyptians in spite of their great numerical superiority only furnish less than half of the total cases treated in hospital.

Moreover, a large proportion of the native cases come from the large towns and cities, where the conditions of life are very different from that of the Arab in the sandy desert, and Dr Tribe notes that he never saw a case of phthisis in a

Bedouin. The Berberines and Soudanese who flock to Egypt for domestic service live in the big cities, and moreover come from a hot climate to the comparative and real cold of a Cairo winter, hence some of them not unnaturally succumb to this universal disease.

Dr Tribe is of opinion that the pure and dry atmosphere is undoubtedly of benefit to early cases of consumption, but he is careful to note that this pure and dry air is not to be found in big cities nor in fashionable and crowded hotels, hence if a patient goes to Egypt for the cure of this complaint he cannot blame the "climate of Egypt" if he fails to derive benefit from a residence in, say, Sheapherd's Hotel. As Dr Tribe says, "there is no mystic influence as regards a cure in merely 'wintering' in Egypt, where the 'wintering' consists in staying in a city, with its street air and its concentrated population."

ANTITYPHOID INOCULATION.

THE following are the conclusions formed by Major F Smith, D.S.O., R.A.M.C., in his prize article on Antityphoid Inoculation (*Journal of Tropical Medicine*, 1904, p. 271) —

"(1) Antityphoid inoculation has a distinct value in protecting the human organism from attacks of typhoid fever.

(2) To obtain the fullest measure of protection the operation should be done, say two months before exposure to infection.

(3) Even when inoculation is performed shortly before exposure to infection, it is a beneficial procedure on the whole.

(4) The protective influence is exerted for some years, long enough probably to tide over the most vulnerable age of youth and earlier manhood.

(5) The protection afforded is in the proportion of 3 to 1.

(6) The proportion of protection is much less than that of efficient vaccination for small pox.

(7) Vaccination against small-pox is about ten times as effective as antityphoid inoculation.

(8) Typhoid under normal conditions at home and in some foreign stations is not a very common disease such as small pox used to be.

(9) Typhoid among soldiers—on active service in most places, and when on peace service abroad, especially in India, South Africa, Egypt, Bermuda, Mauritius and Malta—is a very common and fatal disorder.

(10) Typhoid is a danger to which nurses and hospital subordinates generally are especially exposed.

CONCLUSIONS

The final conclusions come to as regards the practical value of antityphoid inoculation are —

(1) That it is not at present of sufficient practical value to warrant its general adoption by the nation at large.

(2) That it is of distinct practical value to any community in which typhoid breaks out in an epidemic form.

(3) That it is of practical value to those who have much to do with typhoid patients.

(4) That it is of utility for general adoption among new-comers in certain special endemic areas abroad, such as some Indian stations and Malta.

(5) That it is of great practical value at all times to soldiers serving in India, South Africa, and Malta, also, but in a less marked degree, in Gibraltar and other places.

(6) That it is certainly of the greatest practical value to soldiers about to take the field in any tropical or sub tropical country where typhoid is known to prevail

To this last the writer would add that he believes typhoid would be an important factor to be reckoned with also in a campaign at home or in any European country, though we have not had recent experience to guide us in this matter. He is therefore of opinion that antityphoid inoculation is of practical value to armies about to take the field in Europe."

THE death of A P Tchekhov, the celebrated Russian novelist, reminds a writer in the *Semaine Médicale* of the number of men who have successfully combined the two professions of literature and medicine, not to speak of Schiller, Rabelais, Goldsmith and Smollett, in more recent times we have had Oliver Wendell Holmes, Wen Mitchell, Conan Doyle, and Samuel Warren (afterwards the barrister who as Sir Henry Hawkins has said left us all "ten thousand a year"), Sir Henry Thomson, and the living Scotch novelist Andrew Balfour, part author, with Dr Lewis, of the best of books on Hygiene and Public Health, but whose historical novels are well worth reading

UNDER the title of "Hill Diarrhoea in the Plains" Dr P A Nightingale, of Bangkok, Siam, calls attention to the occurrence of this early morning diarrhoea among residents in the moist steamy heat of the plains in Siam. We agree with him that perspiration followed by chills is a fertile cause. It is most common in the hills in India, chiefly, we imagine, because of the extremes of the range of temperature, but it is not unknown during "the rains" in the plains of Bengal. On the whole a not bad name which is expressive of one great factor in its etiology is "chill diarrhoea."

Whatever may be the success of antimalarial operations by the extermination of the mosquito, it can hardly be doubted that similar measures have been very successful in combating yellow fever in Texas. The usual reason for the appearance of this pest has recently passed, and its non-appearance can only be ascribed to the vigorous antimosquito measures taken by the State Authorities of Texas

THE "red light treatment" of small-pox has received a quietus at the hands of Dr Ricketts and Dr Byles, of the small-pox hospitals of the Metropolitan Asylums Board, in their articles in the *Lancet* of 30th July and 26th November 1904

ACCORDING to the *Bradshaw* Lecturer the case mortality of typhoid fever is 15 per cent. In the British Army in India it is unfortunately more like 25 per cent

Reviews.

The First Report of the Wellcome Research Laboratory at Khartoum.

WE have much pleasure in calling the attention of our readers to the first report issued by the Wellcome Research Laboratories, established through the munificence of Mr H S Wellcome (of the well-known firm of Messrs Burroughs, Wellcome & Co) at Khartoum

It seems, and indeed it is, only the other day that the Sudan was in the hands of roving bands of armed Arab tribes, now there is peace and an assurance of plenty, and with peace modern civilization and scientific culture

The new Laboratories of the Gordon College, Khartoum, are intended to promote technical education, and promote the study not only of tropical disease, but of the economic products of the vast country known as the Sudan. The present volume is the first reported and is issued by Dr Andrew Balfour, the Director. The report gives an admirable account of this Laboratory, its equipment and of the work already commenced. One very interesting chapter is devoted to mosquito work in the Sudan. It is a curious comment on popular ideas regarding mosquito prevalence, because Dr Balfour was told "by men who had been there," that there were but few mosquitoes and that the anophelina were absent, whereas his report shows that many kinds are abundantly present as well as most of the malarial-bearing species. The *Culex fatigans* (Weid) is constantly present, and elephantiasis is not unknown. We must, however, protest against Dr Balfour's hasty assumption that Dr Graham of Beyrout, has "conclusively proved" that dengue is carried by this or any other mosquito. It may possibly be so, but we were by no means impressed by Dr Graham's observations when published, and we noticed them at the time. There is much to be done before it can be accepted as a fact that dengue is carried by mosquitoes. Dr Graham's work is interesting and suggestive, but no more, and in a report, intended to be read by scientific men, some degree of greater scientific caution is needed. We would also like for further observations on the alleged connection (Bastian, *Lancet*, 30th January 1904) between filariasis and the cultivation of the banana. This is a point which might be taken up by some of our readers in India. Dr Balfour notes that all forms of malarial infection are to be found in the Sudan, and wells, tanks, pools, &c, are in abundance to provide breeding grounds for mosquitoes. Several interesting maps are given showing the innumerable situations in which mosquitoes have been found breeding in the city of Khartoum. We would like to hear more of the proprietary preparation of amilin which has been used "successfully" (the italics are ours) to rid the rice-fields of mosquitoes

Other portions of this report deal with other biting and noxious insects in the Sudan, with the diseases of the Sudan (a chapter already noticed by us when published elsewhere). Another chapter indicates that a practical study has been initiated in the examination of some of the insects and vegetable parasites injurious to crops.

Mr F V Theobald gives a useful chapter on the mosquitoes of Egypt and the Sudan, which it may be interesting to compare with those in India.

The British Guiana Medical Annual — Demerara Baldwin & Co, 1904

THIS is the thirteenth year of issue of this useful record of medical work in British Guiana. It is edited by Drs Ozzard and Kennard of the British Guiana Medical Service. We had the pleasure of reviewing the last issue in 1902, and we note that, owing to the enormous increase of work caused by a small-pox epidemic in 1903, it was not found possible to bring out this Annual.

We hope that the Surgeon-General's scheme for an annual to be produced by all the West India Branches of the B M A will be carried out, such a record could not fail to be of value to all workers in the diseases of tropical countries.

The terrible experiences of the recent epidemic of small-pox in British Guiana and other West Indian Isles has shown the necessity of amending the quarantine regulations and of bringing them into conformity with those at home. We need not enter into details of the new regulations as described by the Hon'ble Mr Godfrey, M.B., the Surgeon-General, but we note that the following periods are laid down for the observation or surveillance of persons who have been in contact with infectious cases: as plague and cholera, five days; yellow fever, six days; and small-pox twelve days. These regulations give very complete account of the various methods of disinfection. An interesting report on 700 cases admitted to the Isolation Hospital is given, and the point of the differential diagnosis between chicken-pox and small-pox is raised. To the professional mind in England which looks upon chicken-pox as a mere child's disease, this may not appear difficult, but all of us who have seen large epidemics of chicken-pox in adults well know that it can very closely resemble small-pox, and can almost only be distinguished by the fact that less virulent and milder cases of undoubted chicken-pox are found at the same time and in the same place. In British Guiana the negroes suffered most, because of their well-known aversion to vaccination.

There were 75 cases among those who were "said to have been vaccinated," but of 47 of these who claimed to have been "vaccinated" in infancy, no less than 33 showed no mark whatever, 9 very faint single marks, 3 fair

marks and only 2 with good, single marks. Of 8 patients who had been "vaccinated recently" 1 showed no marks, 6 very faint marks, and only 1 good marks. The low mortality of the epidemic was satisfactory if remarkable.

Dr Kennard gives an account of some cases which he calls 'acute anaemia,' it is probable that if he met them now he would examine for the Leishman-Donovan bodies.

Dr Ozzard publishes a short account of the tropical diseases of British Guiana. Malaria is common, but at time of writing no one had found the Leishman-Donovan body. Filariasis is very common. Dr Ozzard is not prepared to give a decided opinion that trypanosomiasis and sleeping sickness is absent from among the aboriginal tribes.

Dysentery is common in all forms, and it is noted that the wash-leather ulcers, described by L Rogers, are commonly met. Epidemic gangrenous rectitis is common among the aborigines. Ankylostomiasis and all forms of round worms are very common, but curiously *Tænia* is rare. *Sprue* is said to be chiefly found in East Indian immigrants, probably what we call in India "chronic diarrhoea."

Hæmoglobinuria is rare, but is met with, bilharzia disease has not certainly been recognised. We note that calculus is "decidedly uncommon," and usually met with in immigrant East Indians. Pulmonary phthisis is exceedingly common among all classes of the coloured inhabitants. It is curious how within the past dozen years the great prevalence of tuberculosis in the native races of the tropics has become recognised, it has always existed, yet people are found to call phthisis the "white man's plague."

Asthma is common, so is leprosy and yaws, syphilis is extremely rife, and "no doubt at times it is difficult to say whether a particular case be syphilis or yaws."

Tinea tonsurans and *T. imbricata* have not been seen, keloids are common, so also is myiasis. Leucoderma is common, and "no doubt of a syphilitic nature." Is there any experience in India in support of this view? Ulcerating granuloma was first described in British Guiana. *Beil-beil* is doubtfully present. Heatstroke and Malta fever are not known. Liver abscess is not uncommon and usually associated with the *amœba coli*. Anthrax is very rare, so is guinea-worm, goatie is unknown, mycetoma is rare, so are snake-bites, but jigger and ground itch are very prevalent. Cataracts are frequently met with among East Indians, less so among the negro population. Cholera has not been seen for 50 years, enteric fever is very rare, and no cases are known of dengue, typhus or of plague. Cerebrospinal fever common, but always from East Indian immigrant ships, as is well known in Calcutta. Herniæ and hydroceles are very common. Cancer is quite common.

There are other good papers in this Annual which space does not permit us to mention. We note that Dr Delamere attempts to connect black tongue markings with ankylostomiasis. We hope that this Annual in its present or in a larger form will continue to flourish.

Medical Electricity a Practical Handbook for Students and Practitioners By H. LEWIS JONES, M.A., M.D. Fourth Edition

THIS is one of Lewis's Practical Series, consists of 536 pages, and contains 168 figures and 11 plates. After a short historical chapter, the apparatus and methods by which electricity is produced, measured and regulated are described fully by the aid of numerous illustrations.

Attention is next directed to the treatment of various conditions and diseases by varying kinds of electricity. One naturally turns to the book with the expectation of finding information as to the best way of exciting the Roentgen rays, and is not disappointed to find the subject fully entered into. In large cities in India there will be no difficulty in utilising the electric mains to charge accumulators and rotate an interruptor, and so generate the necessary current in an induction coil to excite an X-ray tube. In most stations in India, however, there are no electric mains, but it will be a satisfaction to the Civil Surgeon who wishes to set up an X-ray apparatus that "the static machine is a self-contained electrical apparatus capable of generating the necessary electromotive force by itself whenever its handle is turned."

It also gives a steady radiation with X-ray tubes, which is much less tiring to the eye for screen work than the flickering light given by the interrupted discharges of the induction coil. In fact, for screen work, the static machine is admirable. For photography, it is slower than the induction coil, though perhaps it gives finer focus in the pictures. It can of course be driven by hand, by a small engine, or by electricity. The matters of diagnosis and treatment by means of X-rays are entered into—the latter very fully.

There is an interesting chapter on high frequency currents, treatment by means of which is becoming more and more important and which can easily be induced by apparatus usable in a small Civil Station. We can thoroughly recommend the book, not only to those who are thinking of setting up an X-ray apparatus, but to those desirous of keeping up-to-date their knowledge of diagnosis and treatment by electrical means.

Illustrated Key to the Trematode Parasites of Man—By CH. WARDELL STILES

THIS little pamphlet is a United States Government publication, the seventeenth bulletin of the Hygienic Laboratory. It consists of 52 pages of letterpress with 88 excellent illus-

trations, and in addition a bibliography and two indices. It has been written in response to recent requests to the author for information in regard to the trematodes which are parasitic to man, and is offered as a ready reference aid in clinical diagnosis, necessitated by the fact that 120,000 American troops have recently returned from the Asiatic quarter of the globe. These publications will be sent to individuals "in case sufficient reason can be shown why such individuals should receive them." All applications should be addressed to the 'Surgeon-General, U. S. Public Health and Marine Hospital Service, Washington, D. C.'" It does not appear that it can be purchased. It is a book which ought to be in the hands of every practitioner in India, and we cannot do better than advise all such to write and attempt to obtain it. There is ample reason why they should be allowed to do so. It is to be hoped that Dr Stiles will receive enough requests for information on the nematodes to induce him to write a similar monograph on these and other more important parasites.

Essentials of Nervous Disease and Insanity.

—By JOHN C. SHAW, M.D. Fourth Edition by SMITH ELY JELLIFFE, M.D.

THIS book is one of Saunders's Question-Compends. It is not, however, written in question form. Its intention, as stated in the preface, is not that it should take the place of larger works, but that it should be used somewhat as a primer for advanced students. It consists of 190 pages and 53 illustrations, and it may be said at once that it is eminently suitable for the purpose for which it has been written. Containing in a condensed form the essentials of all but the rarest nervous diseases, it will be found useful, not only for advanced students not yet qualified, but also by the qualified student, and the practitioner. In such condensed manuals the most difficult question for the author is how much may be usefully left out without entailing any loss of usefulness in the book. The author states in the preface that limits of space prevent the introduction of anatomical detail or physiological discussions. This is not adhered to in the description of diseases of the brain, and the result is a gain in clearness. We think that a similar treatment of the spinal cord in a subsequent edition would be an improvement. The diseases of the cord are necessarily dealt with on an anatomical basis, and it would undoubtedly increase the usefulness of an already useful book, and necessitate the introduction of only two or three more pages were the symptoms caused by various lesions referred to in terms of the functions normally performed by the diseased parts of the cord. Mental diseases are well dealt with, and here, as in the case of nervous diseases, an extraordinary amount of information has been condensed into a small space without the sacrifice of clearness.

Essentials of Materia Medica, Therapeutics and Prescription writing — By HENRY MORRIS, M.D. Sixth Edition by W. A. BASTEDO, M.D.

THIS is another of Saunderson's Question-Compends and is written in question form. It begins with definitions, description of weights and measures, prescription writing, and the influences which modify the effects of the medicines and their administration. The rest of the book, comprising 292 pages, is taken up with the materia medica and therapeutics of various drugs. The classification is therapeutic, the drugs being arranged according to their actions, a method which would be very useful for students. The "pharmacopœia" used is that of the United States, which differs considerably from that of the British Pharmacopœia, a fact which should be borne in mind by any one using the book. A useful feature is the inclusion of a number of drugs not in common, nor official (B.P.) use, which might be found of value as alternatives in the event of the failure to get satisfactory results from those usually employed.

Firminger's Manual of Gardening for India — By J. CAMERON, F.L.S., Superintendent of the Mysore State Gardens. 5th Edition, Calcutta 1904. Thacker, Spink & Co.

WE heartily welcome a new, the fifth, edition of Firminger. Those who are acquainted with the early editions of this best of all gardening books for India, will be glad to possess themselves of this the latest edition. It has been entrusted to Mr. J. Cameron, the Superintendent of the State Gardens at Bangalore, and the previous edition has been revised at the suggestion and with the advice of Lt.-Colonel Plain, C.B., I.M.S., of the Royal Botanic Gardens, Calcutta.

In the new edition Mr. Cameron has extended the scope of the volume to Southern India, has eliminated matter which is now out of date, and has recast the general arrangement of the book.

The book is divided into four parts, with an appendix and a complete index.

The first part consists of the "operations of gardening," and deals with climate, soil, manure, irrigation, boring, digging, conservatories, frames, pits, decorations, implements and gardening utensils. Then come sections on seeds, diseases of plants, pots and pot-culture, transplanting, cuttings and pruning.

A calendar of operations is also given with advice as to the months for planting, &c., vegetables, fruits and ornamental plants.

The second part is devoted to the vegetable garden, another to the fruit garden, and third to the flower garden.

The native names for flowers, fruits and vegetables are constantly given.

In conclusion we can strongly recommend this new edition of "Firminger" to all our readers interested in either their flower or their vegetable gardens.

The After Treatment of Operations — By P. LOCKHART MUMMEY, F.R.C.S. 2nd Edition. Pages viii and 240. Illustrations 37. Crown 8vo. Price 5s. nett. Baillière, Tindall and Cox, 8, Henrietta St., Covent Garden, London, 1904.

THE after-treatment of operation cases is a matter of considerable importance, and students have some difficulty in learning this part of the treatment practically as they often do not see the case again until some hours after the patient has left the table, and it is only the fortunate few who become House Surgeons that have greater opportunities of acquiring this particular branch of knowledge.

Mr. Mumme's book should be of value to the dresser, house surgeon and practitioner, who has not held a house appointment.

The introductory chapter deals with the immediate troubles which may follow any operation, such as pain, thirst, &c., then the treatment of the wound of complications, such as hæmorrhage, &c., is described. The chapter on that most important subject shock is particularly good and much of the recent work of Cline and other observers has been embodied in it.

After the treatment of complications common to all operations has been considered, that of special operations is discussed. It is, of course, impossible in a book of this nature to lay down all the various little differences one observes in the practice of different surgeons, nor would it be advisable, but the line of treatment usually carried out is fully described. An appendix contains much useful information on the subject of foods, measurements for artificial limbs, &c. This book should be particularly useful in this country to assistant surgeons recently enlisted or to those coming to a larger station where there is more operative work than in the smaller dispensaries. The printing and illustrations are excellent.

The Imperial Guide to India — With maps and plans. JOHN MURRAY London, 1904.

THIS elegant little volume is intended as a brief reliable guide for visitors to India. We are glad to see the ordinary spelling of Indian names and places which is in use in British Society in India have been used, and we have been spared the priggishness of the Hunterian spelling. The little book opens with a wise warning to visitors to remember that India is not a country like France, but practically a continent like Europe, hence advice which is good for Lahore will not apply to Calcutta or Rangoon. Among the agents mentioned who have branches in India, we notice the name of a firm which has, a year ago, come to grief and which should have been excluded when the pages were going through the press. The advice as to clothing is generally sound and written by one with knowledge. We agree that the milk at railway stations is often suspicious, but we doubt if it is practicable to boil it as passengers

are advised to do. This, too, has usually been done in the refreshment rooms. The advice as to railways, expenses, touring, servants, &c, is good, and the visitor can rely upon it. The list of medicines advised is unobjectionable and certainly useful.

On the whole the book is the best guide to India that we know and can be recommended to their friends by our readers. It is elegantly got up, cheap, with good printing, good maps, and is so small that it can easily be carried in the pocket.

The Pathology of the Eye—By J. HERBERT PARSONS, B.S., D.Sc. (Lond.), F.R.C.S. (Eng.) Assistant Ophthalmic Surgeon, University College Hospital, London, &c. Volume I. Histology, Part I. London: Hodder and Houghton, 1904. Price £2-2-0 complete. Pp. 388.

"At last, an Englishman has written a book on the pathology of the eye, which is not only equal to but actually surpasses the German monographs on the subject. After a careful examination of Part I we can say that Parsons' work will undoubtedly be in every respect the greatest literary contribution that has ever been made to the pathology of the eye."

This is the opening sentence in a review on the book under notice appearing in the October 1904 number of the American quarterly '*Annals of Ophthalmology*,' and though unfair on the Englishmen, it is not exaggerated as regards the merits of the book.

The work is to appear in four volumes, the first two dealing with the pathological histology of the eye, the last two with its general pathology. In the first two volumes the part of the eye and its annexes will be considered *seriatim* and the histology of the various morbid conditions described. In volumes III and IV the diseases which affect the eye as a whole are to be discussed, and, as far as possible, traced to their ultimate causes. They will include such conditions as glaucoma, sympathetic ophthalmia, congenital malformations, &c.

The first volume recently issued deals with the pathological histology of the lids, conjunctiva, cornea, sclerotic, iris, anterior-chamber, and ciliary body, together with the bacteriology of the conjunctiva. The illustrations, which are numerous and excellent, are from photographs, not touched up in any way, as fidelity is of prime importance. The book is to subserve, not to replace, work in the laboratory.

The volume is a monument to Mr. Parsons' depth of knowledge, great industry, and originality at observation. Justice cannot be done to it in noticing it in such a limited space as we have at our disposal, but we have no hesitation in saying that it is far and away the finest work, not only in our own, but as far as we know, in any language. It is in fact the work on the subject and will in all probability undergo translation and so obtain a considerable circulation on

the Continent as well as in England and America.

The publishers who, we believe, have only lately begun to publish medical works have done their share very well. The illustrations, of which there are 267, are excellent. There is a good index, and, what is an improvement on the usual list of illustrations, an *index* of illustrations. The bibliography is also complete and is given at the end of each section. We congratulate Mr. Parsons and Messrs. Hodder and Houghton and much look forward to the appearance of the remaining volumes.

"Climate and Health in Hot Climates, and the Outlines of Tropical Climatology; a popular Treatise on Personal Hygiene in the Hotter Parts of the World, and on the Climates that will be met with within them"—By LIEUT.-COLONEL G. M. GILES, M.B., F.R.C.S., Indian Medical Service (retd.), London: John Bale, Sons, and Danielson, Ltd. 1904. Pp. xvii, 184 and 109.

THIS work consists of two parts, as given in the title, separately paged and indexed. The first part, which will be the one most generally consulted, is divided into eight chapters, viz., (1) on housing and domestic architecture, (2) on clothing, (3) on water and food, (4) the tropical day, (5) hints on the management of children in hot climates, (6) hints on the construction of tents and camp sanitation, (7) on the prevention of malaria, (8) on prevention and treatment of certain of the more common tropical diseases. The last is much the longest chapter in the book, of which the seventh and eighth chapters together make up more than one-half.

Lieut.-Colonel Giles is well known as an advocate of the plan of enclosing all houses with mosquito-proof wire gauze screens, constructed so as to fit all openings, whether of doors or windows, which give on the open air. By this means most of the doors which usually fill the walls of an Indian house, are converted into full-length windows, not available for exit and entrance, which are effected by two or more double-swinging doors of wire netting. The bathroom doors are protected by single swing doors of similar material. We have never seen a house thus protected. To say the least of it, it would take some time to get used to it, complete as the protections afforded may be. The expense would also be considerable, especially if transfers were frequent. The advice given as to choice of a house, as regards site, material, &c, is good. But as the author fully admits, here in India we often have to be thankful to get any sort of a house we can. The choice is Hobson's oftener than our own.

As regards clothing, the author strongly advocates the use of mixed silk and wool underclothing, which, though costly, lasts a long time. Starched clothing is certainly unsuitable to the tropics or India, being as impervious to transpiration as mackintosh, as long as it retains its appearance, and unsightly and unpleasant as

soon as the starching has gone out of it. It will lining forms another most excellent material for shirts and underwear.

The author suggests that "the short-fibred Indian cotton possesses certain properties that cause materials manufactured from it to be softer and more absorbent than those made from the harder and longer American fibre." If this is really the case, possibly there may be a better future before Indian cotton than seems likely at present, for it is the shortness of staple of the cotton grown in this country, which is the cause of its comparatively small commercial value.

Waterproof, as is pointed out, is of little value in this country. It is only a protection against slight showers. To be out of doors in really heavy rain must involve getting wet, through sleeves, neck, &c., even though the waterproof material may prevent rain penetrating its own fabric. And as the material which keeps rain out will also even more effectually keep perspiration in, it is better to owe one's wetting to the comparatively innocuous rain. As long as we can keep moving until the opportunity for changing one's clothes arrives, a wetting is not likely to do much harm. It is sitting in wet clothes which is injurious.

Under the heading of "the tropical day" the author mentions the dying out of the old very pleasant custom of using the swimming bath every morning, and notes how the fine old swimming baths in many places are going to ruin from disuse. A great pity, in our opinion, a good swimming bath in a station is one of the greatest alleviations of life in India, for ladies as well as for men. And here we find the one piece of advice in the book with which we thoroughly disagree. "If a plunge bath be taken at all, the best time of the day is probably after the evening game of racquets or tennis—not immediately, of course, but after having given oneself time to cool down somewhat." Bathe in the evenings after tennis, by all means if you have the chance of doing so. But surely the best time to do so is to take the plunge straight from one's game, "hissing hot," not to allow oneself to cool down first. We have always, at any rate, acted on the above plan, when we had the chance, and always with good effect. It must be remembered that the water in a swimming bath in the hot weather is by no means very cold. To stop in the water too long, more than a quarter of an hour or so, is doubtless injurious.

Another excellent piece of advice, in this chapter, is while excluding heat as far as possible, not to exclude light. Semi-darkness is not favourable to the preservation of health. The author remarks that, in his experience, the ladies who have enjoyed the best health in India are those who, owing either to inclination or to the nature of their occupations, were out a good deal in spite of the heat, and so got an and exercise—a much more healthy way of living

than remaining shut up in stifling and depressing semi-darkness. Much good advice to our wives and daughters will be found here and there throughout the book, but we are not sanguine as to their taking it.

Many will probably be surprised to hear that, in the author's opinion, the advantage of residence in the hills over the plains is much more a matter of greater personal comfort than of better health. With this opinion we entirely agree.

In the chapter on prevention of malaria Colonel Giles points out that adequate dosing with quinine, even when it appears to fail to cure fever, usually makes the blood free from malarial parasites, and so at least prevents the sufferer from being a danger to others. We are glad to see that he speaks of the theory that blackwater fever is the outcome of treating malaria with quinine as absurd, an opinion which will, we think, be supported by most men who have seen, or suffered from, much fever in India.

The author strongly emphasizes the fact that boiling, not filtration, is the agent upon which we must rely to purify water. A better appreciation of this fact might have saved the expense of the huge Pastern filters set up some years ago in many Bengal jails. Even when they work well, which is not always the case, the cost of these filters is enormous. With an installation of five hundred candles, which cost five rupees each, are very fragile, and, apart from accident, rapidly wear out, it costs from twenty to fifty rupees a week to keep the filter in thorough working order.

Colonel Giles mentions that for several years he had not a single death from dysentery in the jail of which he was Superintendent, and attributes his success in the treatment of this disease, usually so fatal in jails, to his having treated every case in a solitary cell, where the patient could not possibly obtain any other food than that ordered for him. We are somewhat sceptical as to the impossibility of the patients getting a certain amount of improper food, even in a solitary cell, but there is no doubt that this plan of treatment is sound, and that not only dysentery, but many other diseases in jails, would be best treated in separate cells. Unfortunately, it is usually impossible to carry out the prescription with four hundred prisoners in a jail, and only six solitary cells, four of which are usually occupied, from one year's end to the other by prisoners undergoing judicial sentences of solitary confinement, while only two are available for condemned prisoners, lunatics, punishment, etc., there is not a large balance available for the segregation of the sick, advisable though such treatment may be.

The second part of the book is an invaluable work of reference on climatology, giving information which could not be got in any reasonable compass elsewhere. The letterpress is also readable enough.

The author selects the southern end of the Red Sea, from June to September, as one of the worst climates in the world. It makes a considerable difference, however, which way one is going. We have seen six cases of heat stroke in a three-day voyage down the Red Sea in September, but we have also seen rough weather, with a distinctly chilly breeze, in the same month, but in a different year, when going north. Colonel Giles also hardly does justice to the cyclones of the Bay of Bengal. The storm waves, following on rather accompanying cyclones, on the Hughli in 1864, and on the Megna in 1876, would be bad to beat, both for damage to property and for destruction to life. And we have ourselves seen a tornado cut through the city of Dakka, like a cheese knife through cheese, levelling every building in its track, and taking a large toll of human life.

The book is most readable, and the advice it contains is, as a rule, excellent, and if this advice is, to a great extent, founded on that most uncommon quality, common sense, it is all the better for that. We wish the author all the success he deserves with this the latest work on tropical hygiene.

ANNUAL REPORTS

MADRAS HOSPITALS (1903)

THERE remained at end of the year 607 hospitals and dispensaries, with beds for 3,314 males and 2,212 females. There was a small falling off in the attendances, "which was entirely due to the non prevalence of the usual 'soie eye' epidemic in the hot season. In the Civil Hospitals 157,737 operations were performed, 93.6 per cent of whom were cured or relieved. Turning to Statement III we find over 15,470 operations on the skin, over 4,200 on bones, 1,693 on joints. A including 30 excisions or amputations, 653 amputations, 25 operations on the brain (11 trephining, 13 mastoid), 995 on the face, including 22 harelips, 646 for nasal polypus, 47 rannula, 33 removal of tonsils, over 42,660 on the teeth, 3,753 on the eye, including new growths 128, pterygium 128, lacrymal obstruction 208, iridectomy 238, cataract extraction 1,420 (1,290 cured, 55 relieved, 85 "otherwise," 3 died), 122 operations on the ear, 10 tracheotomies, 86 on the breast, including 39 excisions, 1,088 on the abdomen, including 6 colotomy, 11 on stomach or intestines, 8 for intestinal obstruction, 304 for hernia (251 cured, 10 relieved, 8 "otherwise" and 22 died, 13 remaining), 61 for abscess of the liver (20 cured, 3 relieved, 17 died, 6 remaining, 19 "otherwise"), 2 operations on gall bladder, and 7 on kidneys, operations on rectum and anus 380 for fistula, 309 for piles (no details as to methods in use), on the bladder, for calculus by lithotomy 59, by lithotripsy 2, by litholapaxy 2, showing the comparative rarity of stone in Madras, 777 for stricture of urethra, 131 for urethral calculi, 84 operations on the penis, 3,819 for hydrocele, 13 for varicocele, 66 for hematocele, 46 for elephantoid scrotum (1 died, 2 otherwise, 13 remaining), ovariectomy 19 (4 died), uterine appendages removal, 17, 16 cured, removal of uterus 25 (18 cured, 6 died), obstetric operations 2,237.

An excellent record of good surgical work.

BOMBAY MEDICAL INSTITUTIONS, 1903

THIS report, which is dated July, only reached us in November. It is written by Surgeon General McConaghey, I.M.S. There were 22 new hospitals opened during the year, and 16 closed, making a net total of 644 institutions at work during the year. Surgeon General McConaghey points out that there is still plenty of room for more such institutions, but the tendency of the men qualified in the schools of Bombay is to settle in the towns, which are already well provided with medical men and to leave the rural areas entirely without medical help. The attendance was over four million, and was higher than in the previous year, the number of beds available was 6,724.

We quote the following extracts from the report:—
"Preventive medicine has still much to accomplish in India. The conditions of the people, their manners and customs ren-

der the task an almost impossible one. Take for instance malarial fevers, which are, as usual, and it is to be feared, will always remain, the most numerous cause of admission. While some thing can be done by attacking the mosquito in cantonments (and even there with not always a great amount of success), a large percentage of the populace must ever be exposed to the infection. The sale of quinine does good in individual cases, but the incidence of the disease will be but little affected thereby. The return of tuberculous cases like wise tells its sad tale,—on the other hand it is satisfactory to note that cholera has not been so prevalent. Improved sanitary surroundings, a better water supply, have undoubtedly diminished the epidemics, once so regular and so constant a feature in the health conditions of the people. Dysentery, diarrhoea and diseases of the digestive system are accountable for a very large number of admissions, no doubt the results of the past years of scarcity and privation. It could hardly be expected that so much suffering would not leave its mark. As matters improve, with food good and plentiful, a diminution in the prevalence of these and other diseases may reasonably be expected.

"The total number of surgical operations performed in the Civil hospitals and dispensaries included in Statement No III show a decrease of 2,253, viz., 84,558 against 86,811. The decrease was amongst the minor operations, the major operations were slightly larger in number and equal in importance to those performed in the previous year. The patients operated on numbered 84,049, of whom 67,901 were cured, 1,434 relieved, 1,006 discharged otherwise and 490 died. There were 1,919 tumours and cysts excised. Operations on bones and joints numbered 2,168. Of the amputations, 522 were for injury, 261 for diseases and 15 for deformities, and, of the total, 45 ended fatally. The operations on the eye and its appendages included 125 iridectomies, 67 sclerectomies, 944 extraction of lens, 100 excisions and evulsions of the eyeball and 45 lacerations and extractions of the opaque capsule. Of the operations on the thorax and breast, 14 were for excision of the breast with 2 deaths. The operations on the abdomen included 83 operations for hernia, of which 34 were strangulated, with 13 deaths and 49 for radical cure with 2 deaths. In 304 cases the liver was incised for abscess with 59 deaths. Laparotomy was performed in 65 cases resulting in 29 deaths. Among the operations on the bladder and urethra there were 1,489 for removal of vesical calculi and 190 for urethral stricture. The operations for removal of vesical calculi included 948 litholapaxies, 406 lithotomies and 95 lithotrites, and of these, 75 ended fatally. I regret that the number of cutting operations still remains large. Doubtless some were necessary, but I think the comparison between the crushing and the cutting operations points to a deficiency in the instruments for the former. Of the operations on the female generative organs, 10 were ovariectomies with 3 deaths, and 6 abdominal hysterectomies with 2 deaths. Oophorectomy was performed in one instance, and the case remained under treatment at the end of the year. Among the obstetric operations forceps were applied 89 times, 82 women recovered and 7 died. Version was resorted to in 75 cases with 7 deaths, 39 craniotomies were performed with 2 deaths. Of the 4 cases of cesarian section, 1 recovered and 3 died. The surgical work done in the hospitals has been very satisfactory. Steps will be taken to supply lithotrites where they are required. Much has been done already not only in this, but with regard to all instruments. Wooden handle instruments are gradually being replaced by others which stand repeated sterilization. Operation rooms have been improved and, where necessary, rebuilt, and the danger of septic contamination reduced to a minimum. Several operation rooms, in their construction, arrangements and general management, would compare favourably with most at home and on the Continent, and the general results of the operations performed point to the fact that aseptic surgery is thoroughly understood and extensively practised."

The Surgeon General mentions the following officers—

"The services rendered by Medical Officers, and especially their professional work in connection with hospitals and medical schools, have, for the most part, been highly creditable, and I beg to commend to the favourable notice of Government the names of Lieutenant-Colonels McCloghry, Henderson, Boyd, Monks, Dimmock, J. W. T. Anderson, Stevenson, Lyons, Burke, Collie and Quicke, Majors Dyson, Meyer, Childe and Smith, and Captains Jackson, Evans and Hooton. I can also speak very favourably of Civil Assistant Surgeons Mackenzie, Cardozo, Khan Bahadurs Dadina, Dadaoahaji and Moos, and Assistant-Surgeons Bocarro, Ninavati and Ghandhy, and Military Assistant Surgeons G. C. McMullen, H. A. Lafond, A. E. Almeida and A. V. M. King."

HOSPITALS REPORT, UNITED PROVINCES.

The total number of Civil hospitals and dispensaries were increased by 5. During the year Government drew the attention of Medical Officers to the inadmissibility of opening

now dispensaries with insufficient funds, and also that patients were not to be made to attend daily for medicines when visits at longer intervals would be sufficient. This, it was anticipated would reduce the nominal daily attendance in hospitals, but it is satisfactory to see that in spite of this there was but little falling off in the total attendances. We make the following extracts—

"The number of surgical operations performed during the year increased from 182,548 to 185,087. The number cured increased from 155,656 to 158,492. In August 1903 Civil Surgeons were asked to address the local authorities regarding suitable arrangements for the private examination of patients. It was suggested that a portion of a verandah or room should be screened off, and a couch for the examination of patients provided. I am glad to be able to report that the necessary arrangements have been made in 215 institutions. In some places the introduction has been delayed for want of funds. It is anticipated that the remaining dispensaries will be provided with the necessary accommodation this year.

"The number of patients suffering from tuberculous diseases increased from 3,337 to 6,444. In compliance with the sanction accorded in G. O. No. 18 V 496 B, dated the 4th February 1903, 10,000 copies in English, Urdu and Hindi of a leaflet warning tuberculous patients against certain acts liable to cause the spread of the disease, were printed and distributed to Civil Surgeons during the year for distribution to medical officers in charge of medical institutions.

"Major Marks, I.M.S., heads the list of selected operations performed by I.M.S. officers with 654 operations, of which 540 were extraction of lens. Lieutenant Colonel Lukis performed 510 operations, and Majors Cadoll and Morwood performed 415 and 357 respectively. Dr Macleod performed 199 operations.

Civil Assistant Surgeon Har Prasad heads the list of operations performed by Civil Assistant Surgeons with 292 operations, of which 218 are for the radical cure of hydrocele (not injection of iodine). The next three on the list are—

Civil Assistant Surgeon Manmohan Dass—262.

" Gopal Chandra Gupta—240

" Sripati Sahai, Rai Bahadur—216 "

Turning to Statement IIIA, which details the operations performed in the year 1903, we find 1,651 operations on tumours, 3 operations for aneurism, 316 removals of lymphatic glands, 3 removals of nerve ganglions, 17 operations on skull and brain, 37 rhinoplasties, 54 for harelip, 56 for ranula, one for cleft palate, 692 for entropion, 1,121 for trichiasis, 105 for pterygium, 173 for lacrimal obstruction, 264 iridectomies, 2 sclerotonies, 20 of tattooing cornea, 5172 for cataract (4,499 cured, 132 relieved, 393 discharged otherwise, 1 died and 298 remaining in hospital), 102 of excision of eyeball, 55 excisions of the breast, 40 laparotomies, one removal of vermiform appendix (is appendicitis so rare as this?), 2 colotomies, 195 for hernia, 30 for abscess of liver (12 died), one nephrotomy, for hemorrhoids 150, by injection 11, by ligature 42, by excision 84, by crushing 7, by cautery 6, for calculus in the bladder, suprapubic 63, lateral perineal 303, median perineal 23, vaginal 3, by lithotomy 44, by litholapaxy 566. Hydrocele operations, by tapping 8,671, tapping with injection 203, incision 1,009, excision of parietal sac, 236, ovariectomies 31, uterine appendages 1.

JAIPUR MEDICAL INSTITUTIONS

THE annual rainfall was 23.3 inches, or slightly below the average in 1903. In Jaipur City 58 deaths from small pox and 244 from measles were reported. One heard more than usual about measles in the reports for 1903, this disease was probably more than usually prevalent in India in that year.

As usual the surgery in Jaipur is good, the report tells of 27 tumours and 19 cysts being removed, without a death, of 5 successful ovariectomies, 126 large abscesses, 39 bone operations, 10 amputations, 10 Ait-Jocseho operations for trichiasis, 289 cataracts, in 199 persons, 224 of which got good sight, 4 "otherwise" and 11 remained. Lieut. Col. P. D. Pank, I.M.S., did 219 cataracts and Asst. Surgn. D. Singh 20. Iridectomy for glaucoma was done in 14 cases. There were 25 abdominal operations, including 8 by "Baccini's method" (sic) for radical cure.

"Vesical calculi were removed in 43 cases by litholapaxy with no death, in 3 cases by lateral lithotomy with one death, and in 4 cases by perineal lithotomy, with no death.

"All the cases of vesical calculus removed by litholapaxy made excellent and quick recoveries. The largest stone removed by this operation weighed 935 grains, and the average stay in hospital for each case was 4.18 days.

"The three cases operated on by lithotomy were unfit for any other operation, and the case which died after operation was that of a man worn out by disease suffering from cystitis and renal trouble, his stone weighed 1,072 grains.

"Four cases of vesical stone treated by perineal lithotomy were all successful and gave excellent results, these were cases in which a lithotrite large enough to crush the stone could not be passed by the urethra, a small staff was used

and an incision made in the median line just big enough to permit a sufficiently large lithotrite to enter the bladder, one direct stabbing incision going straight into the bladder on a grooved staff was sufficient. The largest stone weighed 1,501.5 grains and the average stay in hospital was 12.5 days."

There was a marked improvement in the health of the Jaipur Central Jail, the death rate being 22 per 1,000 contrasted with 40 per mille in previous year. Overcrowding, however, persists. In the death list we notice two deaths from what is vaguely called "moningitis." In the Central Jail the accommodation is for 540, the average daily strength was 631, the maximum population 696, the daily average sick in hospital only 7. On the other hand the District Jail had plenty of spare accommodation.

The record of medical and surgical work is very creditable to Lieut. Col. P. D. Pank, I.M.S., and his assistants.

VACCINATION IN BENGAL, 1903-04

THE total number of vaccinations done in Bengal was over 2½ millions, there was an increase in primary vaccination and a falling off in revaccinations, this decrease is attributed by Major F. C. Clarkson, I.M.S., the Sanitary Commissioner, to the less prevalence of smallpox and consequent less demand for revaccination to stamp out epidemics. It is satisfactory to see an increase in vaccination in 28 out of the 49 districts of the Province. The protection afforded to infants is shown by the rate of 359 per thousand of one year children, in 15 districts the rate of protection was over 500 but in 8 districts, including the Orissa district, the protection rate was below 200 per mille. Of the vaccinations done nearly ¾ of a million were of six points. The average cost was one anna and one pie.

In the Vacino Depot at Calcutta 767 calves were vaccinated and 130,680 grains of lanolin paste made, in the Darjeeling Depot 229 calves were used, and nearly 50,000 grains of paste supplied. In both there was an increased output, due to a steadily increasing demand for this lymph.

Correspondence.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In your issue for the month of December, 1904, a table showing the rates of the Indian pay of officers of the I.M.S. in Military employ is printed. This table, which by the way is incorrect, has evidently been taken from the memorandum issued by the India Office.

The increased rates of pay were sanctioned in G. G. O. 1047, dated 23rd October, 1903. This order laid down no fixed scale as appears in your table for officers holding officiating appointments. It is apparent that the pay in an officiating appointment cannot be paid by the rank of the officer holding the appointment.

For instance (1)—a Lieutenant may officiate for a Captain, in that case he gets his grade pay and half staff of the appointment. It has been ruled, however, that the extra allowance for an officiating charge shall never be less than Rs. 100 per mensem. In the above case a Lieutenant will get

$$\text{Rs } 350 + 100 = \text{Rs } 450$$

This is the least an Officiating Lieutenant can be paid, yet your table shows Rs. 425 as being the pay drawn.

(2) If a Lieutenant officiate for a Lieutenant-Colonel his pay would work out at

$$350 + \frac{1250 - 900}{2} = \text{Rs } 525$$

Grade pay Half staff of
a Lt.-Colonel

However an officiating Medical Officer is entitled only to so much of the staff of an acting appointment as will not exceed the consolidated salary of his rank had he held the appointment permanently.

In case (2) a Lieutenant will get—

$$\text{Rs } 350 + 154 = \text{Rs } 500$$

I think enough has been written to show that column 4 of the table is absolutely incorrect. No such pay is drawn by officiating Medical Officers in Military employ. In fact, the least such an officer can get is always Rs. 25 better in each rank than is shown.

However the real importance of this error is that I believe the original memorandum was submitted to the local administrations at the time the increased pay for officers of the I.M.S. in Civil employ was under consideration. It will be unfortunate if these figures are accepted as the rates suitable for officiating officers in Civil employ.

Yours, &c.,
MILITARY EMPLOY

WHAT SURGICAL PROCEDURE IN LIVER ABSCESS GIVES MOST CHANCE TO THE PATIENT

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—Under the above heading Dr Huntly raises certain questions in connection with operative treatment of abscess of the liver. It does not appear, however, that his letter exhausts the debatable points, and it seems desirable to enquire whether the method usually employed to diagnose and localise a hepatic abscess, namely the thrusting of a trocar into the liver through the abdominal or thoracic wall in various directions is not a relic of barbaric surgery, which should be discarded as completely as has been the "subcutaneous" operation for the radical cure of hernia. The procedure dates from the time when to open the abdomen and examine the contained organs by sight and touch was attended by so much danger that to do so was, except in rare instances, unjustifiable. At the present time, however, when exploratory laparotomy conducted with proper care is one of the safest of major operations, the whole position is changed, but it does not appear that in the operation for abscess of the liver full avail has been generally taken of the advantages which these modern advances have placed in the hands of the surgeon. The usual method of exploratory puncture of the liver through the abdominal wall is attended with certain drawbacks and dangers. It inflicts, usually, needless damage on the organ especially in cases of small acute abscess, since it has often to be repeated until the operator strikes the abscess, of the position of which he may be in entire ignorance. If the abscess is not reached at the first puncture there will almost certainly be bleeding into the peritoneal cavity from the puncture wound in the liver so soon as the aspirator is withdrawn, and the blood which escapes may or may not be infective. Again the liver might easily be penetrated and the trocar inflict injury on the underlying stomach or intestine. Finally the needle may miss a small acute abscess, even after repeated punctures.

For these reasons we have recently entirely discarded exploratory aspirations through the abdominal wall and in those cases in which the symptoms and signs point to a hepatic abscess, we carry out the following procedure—

The abdominal cavity is opened over the most prominent part of the liver, usually through the right rectus muscle, and if the evidence of sight and touch does not show that the abscess lies under the wound this is enlarged until it is long enough to admit the whole hand and permit of the thorough palpation of the whole of the surface of the organ which is covered by peritoneum.

In acute tropical abscess we have found that, as might be expected from experience of an acute abscess in any part of the body, the portion of the liver surrounding the abscess is oedematous pitting under the finger. If the abscess is large the whole liver may be oedematous, but in this case the oedema is more pronounced at one spot than over the rest of the organ. Guided by the hand in the abdominal cavity the trocar of the aspirator, entering the liver where this lies under the abdominal wound, is pushed on towards the place where oedema is greatest and the abscess thus localised without unnecessary laceration of the organ. Our experience in this operation is not yet great, but it has been so entirely satisfactory, and the information yielded has been so precise that we are not likely to again revert to the older method of blind puncture with its attendant uncertainties, nor do we consider judging from our limited experience of the operation, which has included some seriously critical cases, that it entails increased shock and risk, but rather that, by shortening the exploratory part of the operation, it has a contrary effect. We therefore bring it forward here hoping that others will try it, and confident that the result will not be disappointing.

Although we do not wish to minimize the good which would result from the determination of the surest way in which to shut off the peritoneal cavity during the few hours necessary for adhesions to form, still we consider that it is by means of early diagnosis and increased certainty in localisation of an abscess when such exists, that the mortality after operation is likely to be most largely diminished.

The value of the leucocytic count in distinguishing between suppurative and non suppurative hepatitis is a point upon which further information is very desirable and another is the usefulness of the Roentgen rays in which connection it is advisable to state that one of us (R. P. W.) has noticed that in one case the rays threw a very definite shadow on the fluorescent screen corresponding to the position of the abscess as verified by subsequent operation. The wall of the abscess in this case being thick and fibrous.

We are Sir
Yours faithfully,
CLAYTON LANE,
R. P. WILSON

PRESIDENCY GENERAL
HOSPITAL, CALCUTTA
28th December, 1904

[We invite further discussion on this important subject —
ED, I. M. G.]

Service Notes

A VERY successful I. M. S. Dinner took place in Calcutta, at the Dalhousie Institute, on 27th December 1904. Sir Benjamin Franklin, K.C.I.E., the retiring Director-General was in the chair, on his right was Colonel McKay, C.I.E., P.M.O. Presidency District, and on his left Colonel G. Bomford, C.I.E., the Director-General Elect. The following I. M. S. Officers attended—Sir Benjamin Franklin, Colonel McKay, Colonel Bomford, Lieutenant Colonel Lewtas, Lieutenant Colonel F. MacCurtie, Lieutenant Colonel Peck, Lieutenant Colonel Harris, Lieutenant Colonel Charles Major F. J. Drury, Major A. Bud, Lieutenant Colonel D. G. Crawford, Lieutenant Colonel Dobson, Lieutenant-Colonel J. Tull Walsh, I.M.S., Colonel R. Macrae, Lieutenant-Colonel Gibbons, Major Alcock, Major F. P. Maynard, Major W. J. Buchanan, Major J. R. Adie, Major Pilgrim, Major E. H. Browne, Major Clarkson, Major MacNab, Major F. O'Kinealy, Major B. H. Deane, Captain Leonard Rogers, Captain Clayton Lane, Captain A. Gage, Captain R. P. Wilson, Captain E. O. Thurston, Captain W. V. Coppinger, Captain Urwin, Captain S. Anderson, Captain Olemesha, Captain Moses, Captain Black, Captain J. G. Murray, Captain H. Leicester, Captain McCay, Lieutenant Justice, Lieutenant P. Connor, and Lieutenant Dutton.

After the usual loyal toasts the Director-General proposed the continued success of the Indian Medical Service in the following speech which we quote *verbatim*—

"When I was told that it was desired to have a service dinner before I left Calcutta, I received the news with somewhat mixed feelings. On the one hand I was greatly pleased at the prospect of meeting so many of you again before my retirement, on the other, I had no wish to be present at any formal gathering of my brother officers before the question of the increase in civil pay had been definitely settled. But, gentlemen, on thinking the matter over, I came to the conclusion that I could meet you with a clear conscience, for I felt that I have done my best, and that the delay in the settlement of this great question was inevitable in view of the magnitude and variety of the interests involved, and the number of different authorities who had to be consulted. It may be of comfort to you to know that the Government of India have in my opinion treated the service with justice, tempered I may say with liberality and that if the orders of the Secretary of State, which may now arrive by any mail are in conformity with the recommendations of the Government of India, the Indian Medical Service will continue to be the best State Medical Service in the world.

"There will no doubt remain in our service officers who are not entirely contented with their lot in life, but such a condition of affairs is not unknown in the other services of Government, and indeed so far as my experience serves, is common in every walk of life, and in every rank of society. But my experience as Director-General has shown me that there is a good deal of discontent in the Indian Medical Service that is due to avoidable causes. Some of the causes are the errors of administrative officers, including, of course the Director-General himself, but much more is due to officers failing to make the most of the opportunities that are continually presenting themselves to us all. To administrative officers I would urge the importance of placing the service of the State first but doing so to use every effort to consult the wishes of the individual. To young officers I would urge the importance of work for work's sake. A young officer who has had a distinguished career at the University or hospital arrives in India and is disappointed to find that the work at first set him to do is not in accordance with the opinion he has formed of his own abilities and qualifications, and it happens, I am afraid it often happens, that such a young officer falls into the habit of despising his work, and eventually of neglecting to perform it to the best of his ability. He says, 'What does it matter? Nobody cares.' But, gentlemen, we all care. For the credit of the service we all desire that every officer in it should do his duty, and whenever occasion arises a little more than his duty, and earnest work will always secure its reward. Many of the best medical and surgical reputations in this country had their origin in very humble stations. I know an officer, and he was a young officer at the time who obtained an appointment to a professorial chair on account of the excellence of the report on the work done, and the observations made by him at a small frontier station, and I could quote other instances of similar recognition of good work done in distant and unimportant stations.

"I would impress on every young officer the excellence of Professor Huxley's advice 'Know something of everything, and every thing of something.' Choose a subject and make yourself its master. The time will come when your knowledge will bear abundant fruit, and even if this time never comes the pleasure added to life is incalculable.

"I have addressed myself mainly to young officers, although they are in a minority here, because I am at the other end of the service chain. In a few days I shall have handed over the duties and cares of my office to my successor, and this is the last time I shall be present as an officer on the active list, at an Indian Medical Service dinner. I take the opportunity to thank you all for your loyalty and generous support during my term of office."

"Gentlemen, I will now ask you to join with me in drinking continued success to the Indian Medical Service" (Applause).

Colonel Bomford proposed a vote of thanks to the chairman, and Lieutenant Colonel D. G. Crawford a vote of thanks to Captains R. P. Wilson and E. O. Thurston, the Secretaries to the Dinner, who with the kind help of some ladies had done so much to make the Dinner a success.

Major Deane treated us to several songs, and the Dinner broke up shortly after midnight.

CONSIDERABLE disappointment was felt that it could not fall to the lot of Sir Benjamin Franklin to make any announcement as to the long deferred and much needed improvements in the pay of the Civil Department of the Service. The Service, however, will not forget that Sir Benjamin had worked hard to carry the new pay regulations, and his Directorship will be remembered as the period of this important event in the history of the Service.

SURGEON GENERAL G. BOMFORD, C.I.E., M.D., I.M.S., has been appointed Director General, I.M.S., *vice* Sir Benjamin Franklin, K.C.I.E., retired.

Surgeon General Bomford was born in 1851 and entered the Service 30th September 1874.

A Correspondent sends us the following extract on the way the Japanese manage their Medical Department in the Field. All I.M.S. officers who were in China some years ago can testify to the thoroughness of the Japanese equipment—

"In the organisation, equipment and service of her Army Medical Corps, Japan has shown that she can give points to the civilised world. She has recognised to an extent that no other nation has done previously that the most formidable danger in war is not the destructive power of the enemy but preventable disease and preventable mortality."

Consequently long before the outbreak of hostilities medical officers proceeded to the coming area of operations and carefully tested all his food resources of the country for the armies that were to follow after. These men, long before the arrival of the troops, had sampled all the food, fruit, and vegetable supplies which would be sold by natives along the line of march. They accompanied scouting and foraging parties, and tested the wells with microscopes and chemicals, so that there could be no danger from contaminated water. They made careful supervision of clothing and shelter for the troops, and in every camp medical officers have lectured to the men on hygiene and sanitation.

The exceptional cleanliness of the Japanese soldier, supplemented by such care and education, has saved the Japanese military strength thousands of lives. I have been told by one of their officers that they always make a point of going into battle with their best and cleanest clothes. "We fight like gentlemen," he said, "and we die like gentlemen, and, therefore, we choose to dress like gentlemen." But underlying the sentiment is the practical fact that new and clean clothing if carried by a bullet into a wound is far more antiseptic than old and dirty raiment. No one is better aware of this than the Japanese, and eyewitnesses of the recent campaign have been repeatedly impressed by the sight of the Mikado's hygienic warriors grouped in a state of nudity about wells, streams, and pools of water, during pauses in the fighting, tubbing themselves, cleaning their teeth, and washing their khaki uniforms and other clothing in readiness for the next fight. It is a wise and wholesome practice in the midst of imminent wounding and disease which cannot but exercise a material effect upon the ultimate result of the war.

For from the medical and hygienic point of view, the material point of contrast between the Russian and Japanese soldier is that the conditions surrounding the former are the direct converse of those enjoyed by the latter. While the Russian is dirty and ignorant of the simplest rules of sanitation, the provision made by his Government and military authorities for his medical care have been wholly inadequate. The statements of Russians themselves show how disgraceful has been the neglect in this respect.

WE extract the following from the Journal of Military Surgeons, U.S. Army—

"At the last meeting of the Association of Military Surgeons, Dr. Wreden of the Russian Army gave an interesting account of some features of the work of the Imperial Military Medical School at St. Petersburg. M. Marcou in a recent number of the *Archives Générales de Médecine* gives a rather over-detailed description of the institution. It is the only

school of the kind in Russia and takes the place in the University of St. Petersburg which would have been occupied by a general Medical Department.

It is an ancient institution, having celebrated its centennial in 1898. It is the oldest medical school in Russia and its history is connected with the first rational efforts at instruction in the empire. Peter the Great was the first to found a school of medicine. He built several hospitals, but there were no physicians to manage them. In 1798 the Emperor Paul signed a decree ordering the construction of the Medico-Surgical Academy. Gradually it rose to its present position. The German influence in the field of medicine has been very strong, but even at the time when French culture dominated all the departments of intellectual activity in Russia, its influence in medicine was nil. In the olden times it was the seminaries of priests, especially which furnished the medical students for the medical career could scarcely be called brilliant. But gradually, the situation has been improving, and a larger number of young men have turned their attention to medicine. Even now the Russian military physician is more poorly paid than any other officer of corresponding grade. Only the Russian Christians or Mahomedans are admitted to the school. Israelites are refused. The number of students is limited to about 750. That is a small number for a large capital. But there is also the Institute for Women Physicians, with 1,200 students. The cost of the course for a year is sixty roubles, or \$32. The course extends over a period of five years, and after finishing it, the student is at liberty to practise anywhere in the vast empire. The students enter the school at about eighteen years of age. They wear a uniform, and carry a saber, and are officially under military discipline. The students and professors, in reality, form part of the army.

For each course there is a commanding colonel. He inspects the students, signs their passports and all sorts of papers, and, in case of any disturbance, he judges the culprits. But, in spite of appearances, no trace of military spirit exists in the school. In general, the students appear to be very quiet, and hard workers. At the end of five years there is a comprehensive and long examination, consisting of twenty-eight parts, which alone gives the right to practice. About 150 students are given the title of physician, with 'satisfactory' or 'extremely satisfactory'. From this number about seventy can be presented as candidates for the Institution of Improvement. A thesis, usually on general pathology, is presented by each candidate, without any signature. These theses are compared, and the ten most desirable are designated, and the authors are "Physicians of the Institution of Improvement." These young physicians are connected with the school for three years. The first seven are paid \$53 a month. The other three are not paid, but have the same privileges. They choose a specialty, and study with a professor for the three years. They pass examinations during this time to obtain the title of Doctor of Medicine which is of more value than the first title of Physician which they have received. Every year several of the young physicians are sent to a foreign country to study in the line of the specialty which they have chosen.

After a period of two years of foreign study, the student is eligible to the examination leading to the title of Private Docent. Thus the student will have spent, at the end of this time, ten years in study—five in the academy, three with a Russian professor and two abroad. The professor is at liberty to choose his own assistant. As to the election of professors, when a chair is vacant, the fact is published, and every physician in Russia is at liberty to present himself as a candidate. Generally they are chosen from the old assistants or from the provincial professors. The professor is calm in his manners, and speaks without gesticulating. Original work is especially encouraged among the members of the faculty. The institution appropriates annually a sum of about \$800,000 for distribution among the professors of the institution who, during the year, have produced text-books on subjects connected with their special department of medical science. This year the money was divided between Professor Bechtereff, for a book on the functions of the brain, and Professor Kravkoff, for a manual of pharmacology.

The scholastic year lasts from the 16th of September to the 1st of May. The first two years are devoted to the preparatory course. The last three years to the special medical courses. The theoretical work lasts from nine o'clock in the morning to two o'clock in the afternoon. Laboratory work is very comprehensive and carried out on a large scale. To this the afternoon and evening hours specially are given up. The Minister of War is very generous, and large sums are devoted to the maintenance of the laboratories. The instruction of the hospitals amounts to very little and a vast amount of material is wasted. At the end of the first year if the examinations are not satisfactory, the student is dismissed from the school. The examinations of the other years are less severe.

This medical school at St. Petersburg supports a complete corps of medical instructors, which compares favorably with the faculties of the large capitals of the West. The writer

believes that the theoretical instruction and laboratory advantages are more comprehensive than the same work in Paris. On the other hand, the hospital work in Paris is superior, for the students can work in all the hospitals of the city. Finally, everything is ruled methodically here, and the student is not left to himself as he is in other countries."

ONE of the pleasant episodes of the successful Meeting of Surgeons, United States Army, at their 13th Annual Meeting at St. Louis, was the presentation of diplomas of Membership to the officers representing the Medical Departments of the armies of other nations. The Indian Army was ably represented by Colonel Henry Hamilton, C.B., I.M.S., while Colonel H.W. Murray, R.A.M.C., represented the Home Army Medical Department.

THE Congress of Military Surgeons at St. Louis passed the following resolution on Military Education, they recognize that if sound ideas on sanitation are to prevail we must educate the Military officer, as well as the soldier—

"That while appreciating the fact that military sanitation has finally been introduced into the general scheme of military instruction and has been made a requirement in the examination of Second Lieutenants for promotion, nevertheless this Association believes that an adequate knowledge of 'the care of troops' is of such vital importance to our Army that it should be given adequate recognition in all our Army and Navy schools and especially in the Staff College and War Colleges, and that the present courses at West Point and Annapolis should count in the requirements for graduation, it therefore respectfully petitions the President to make this resolution effective."

LIEUTENANT-COLONEL G. M. GILES, I.M.S. (ret'd), will be in charge of one of the two Medical expeditions sent out by the energetic Liverpool School of Tropical Medicine. They will visit Nigeria, Gold Coast and Lagos.

THE following tables are of interest—

The proposed Field Service Regulations, U.S. Army, provide for Field Hospital accommodation of but 216 beds, with a personnel of but 8 Medical Officers, 16 non commissioned officers and 82 privates for a *Division*, numbering approximately twenty thousand men.

Whereas the experience of the best organized armies of the world shows that this allowance is much below the actual requirements

Germany having	1,200	beds with	54	officers and	282	men per Divn
France	400	"	44	"	560	"
Great Britain	300	"	15	"	201	"
Russia having	840	"	36	"	428	"
Japan	1,200	"	48	"	648	"

and Whereas the said proposed Field Service Regulations U.S. Army, provides for a *Divisional Ambulance Establishment*, the personnel of which numbers but 6 officers, 16 non commissioned officers and 122 men, while that of Germany numbers 14 officers, 16 non-comd officers and 230 men

France has	14	"	25	"	192	"
Great Britain	8	"	32	"	170	"
Japan	13	"	61	"	342	"
Russia	6	"	and 235	men (J" A M" S U S")		

THE subject of the Enno Sander Prize Medal Essay was "The Relation of the Medical Department to the health of Armies", it was won by Brigade Surgeon W. Hill Chimo, A.M.S. (ret'd), a veteran officer remembered by many in India. The second prize fell to Lt. Col. H. Hathway, R.A.M.C., from Jhansi.

THE following is the personnel of the committee to consider the organization of an International Congress of Military Surgeons

Surgeon General Walter Wyman, F.R.C.S. & M.H.S., Colonel Pietro Imbriaco, Italian Army, Captain Juan Redondo, Spanish Navy, Inspector General R. W. Copinger, British Navy, Don Joaquin Yela, Guatemala, Don Salvador Cordora, Honduras, Don David Matto, Peru, Colonel H. Mareschal, French Army, Colonel G. Sterling Ryerson, Canadian Forces, Colonel Augustin Aguirre, Mexico, Colonel John Van R. Hoff, U.S.A., Surgeon Henry G. Beyer, U.S.A., Colonel Nicholas Senn, Ill. N.G., and Major James Evelyn Pilcher, U.S.A.

CAPTAIN E. H. R. STANEY, I.M.S. is appointed to the officiating medical charge of the 2/3rd Goorkha Rifles.

LIEUTENANT J. C. KUNDHART, I.M.S. is appointed to the officiating Medical charge of the 2/39th Garhwal Rifles.

CAPTAIN M. MAOKELVIE, I.M.S., is put in charge of the Gorakhpur Recruiting Depot.

CAPTAIN J. W. WATSON, I.M.S., Medical Officer, H.B.M.'s Consulate, Turbati, Haidari, is granted privilege leave for 41 days.

MAJOR D. G. MARSHALL, I.M.S., is transferred to the temporary half pay list from 25th September 1904.

THE following promotions are gazetted—

Captains to be Majors, I.M.S.

Dated 27th July 1904

BENGAL ESTABLISHMENT

PATRIK BALFOUR HAIG, M.B., Thomas Richard Archer Fullerton, M.B., Ralph Henry Maddox, M.B., Edward Victor Hugo, M.D., Harry George Melville, M.B., Herbert Austen Smith, M.B., Douglas Richard Green, M.D., George McIvor Campbell Smith, M.B., Hubert Mahus Earle, Joseph George Hulbert, M.B.

MADRAS ESTABLISHMENT

PULTENY CHARLES GABBETT, Jobu Lewis Macrae, M.B.

BOMBAY ESTABLISHMENT

FRANCIS EDWARD SWINTON, Sidney Harvey Bunnett, M.B., Thomas Jackson, M.B.

Lieutenants to be Captains, I.M.S.

Dated 27th June 1904

GODFREY EUSTACE CHARLES, M.B., Anderson Gray McKendrick, M.B., Owen St. John Moses, M.D., John Wishart Little, M.B., Fred William Sumner, M.B., Harold Rothery Nutt, M.B., F.R.C.S., John Alfred Baines, William Duncan Ritchie, M.B., Norman Emil Henry Scott, M.B., John Kenneth Sprot Fleming, Evelyn Charles Hepper, Charles Edward Southon, M.B., George Fowler, James Husband, M.B., Henry Beltram Foster, George Charles Lovell Kerans, Christopher Birdwood McConaghy, M.B., Henry Warwick Illus, Edward Wemyss Brown, John Beresford Christian, Andrew Murphy, M.B., Frederick Thoughton Thompson, M.B., Lawrence Percival Brassey, M.B., Colin Forbes Marr, M.B., Satis Bose, M.B., Patrick Laurence O'Neill.

MAJOR H. S. WOOD, I.M.S., Civil Surgeon of Sylhet, was granted two years' combined leave, and Major E. A. W. Hall, I.M.S., on the termination of his special inquiry into kala-azar was appointed Civil Surgeon of Sylhet.

MISS BENSON, M.D., of the Kama Hospital, Bombay, was permitted to return to duty within the period of her leave.

ON return to his regiment from Tibet, Major A. W. Dawson, I.M.S., took over the civil medical charge of Roorkee.

WE note that in the list published of Fellows of the Allahabad University there are no representatives, as far as we can discern, of the medical profession.

LIEUTENANT O. G. SEYMOUR, I.M.S., has passed the Lower Standard Examination in Urdu.

MAJOR G. T. MOULD, I.M.S., 1st Lancers, has been granted leave out of India pending retirement from the service Pension Service, 17th year commenced 3rd June 1904.

CAPTAIN T. G. N. STOKES, I.M.S., has been appointed Civil Surgeon of Bilaspur, C.P.

THE following is a part of the new "Mark System" for regimental efficiency—

"Physical inefficiency—If the ratio of inefficient 'constantly sick' in hospital through venereal diseases or alcoholism for the quarter ending 31st December 1904, exceeds 10 per thousand, a deduction of 5 marks for each point per thousand will be made. For example, if a battalion 1,000 strong has an average of 15 constantly sick in hospital from the above causes during the quarter ending 31st December, 25 marks will be deducted."

LIEUTENANT COLONEL LESLIE, M.B., I.M.S., the Sanitary Commissioner with the Government of India, has gone home on three months' privilege leave. The duties of the office will be carried on by the Director General, I.M.S.

MAJOR MEYER, M.D., Major Child, B.A., M.B., Lieutenant-Colonel M. A. T. Collie, M.B., Major Collis Barry, F.R.C.S., Lieutenant Colonel Dimmock, M.D., Major H. Herbert, F.R.C.S., Dr. N. F. Surveyor, Dr. S. K. Nariman, Lieutenant-Colonel Burke, B.A., M.B., Dr. J. A. Turner, Mr. S. A. Powell, B.A., M.Ch., have been appointed Fellows of Bombay University.

IT is notified that the Right Hon ble the Secretary of State for India having had under consideration the question of assimilating the rates of half pay of the Indian Medical Service to those in force in the Royal Army Medical Corps has decided to apply the scale laid down in Article 478 of the Royal Warrant of the 26th October 1900, to officers of the Indian Medical Service below the rank of Colonel Surgeon Generals and Colonels of the Indian Medical Service, in conditions which would involve transfer to half pay in officers of lower rank will, as now, be allowed to reside in England on un-employed pay reckoning in full the time thus passed as service for pension —*Gazette of India*, December 10th, 1904

LIEUTENANT COLONEL R JAMES, I M S, arrived at Trivandrum and became Durbar Physician to the Maharajah of Travancore on 14th November 1904

LIEUTENANT COLONEL F C REEVES, I M S., is due back from nine months' leave on 8th June 1905

LIEUTENANT COLONEL W B BROWNING, C I E, I M S, returned from furlough on 9th January 1905

MAJOR F C PEREIRA returned from leave on 6th January 1905

MAJOR O A JOHNSTON, I M S, reverted to the Military Department on 14th November 1904

MAJOR J R ROBERTS, F R C S, I M S, A M O in Central India, is granted four months' furlough from 14th October 1904 This order cancels that of 10th October 1904

CAPTAIN W R. BATTYE, I M S, is appointed to officiate as Agency Surgeon at Meshed

THE retirement of Surgeon General D Sinclair, C S I, and of Lieutenant-Colonel W L Price is gazetted, the former from 15th November, and the latter from 4th December 1904

MAJOR G B IRVINE, I M S, has been granted eight months' combined leave, which includes three months' Somali land leave

CAPTAIN W H DICKINSON, I M S, is appointed to the medical charge of the 31st Lancers

LIEUTENANT D G BAKER, I M S, is appointed to officiate in medical charge of 107th Pioneers

CAPTAIN W D KEYS, I M S, is appointed to the medical charge of 113th Infantry

CAPTAIN J C S OXLEY, I M S, was granted two months' privilege leave from 13th November 1904

CAPTAIN T B KELLY, I M S, who has recently returned from Tibet, has been appointed to the officiating medical charge of 1st Lancers

CAPTAIN D MCCAY, I M S, Professor of Physiology in the Calcutta Medical College, was allowed one month's privilege leave from 29th December, 1904, or date of availing of it

THE following officers have been appointed Fellows of the Punjab University —

LIEUTENANT COLONEL F F PERRY, I M S, Major J C Lamont, M B, I M S, Captain D W Sutherland, I M S, Major H G Melville, I M S, and Rai Lala Beli Ram Bahadur

COMBINED leave for six months has been granted to Major W B Lane, I M S, Superintendent, Central Jail, Jubbulpore. It is reported that on his return from leave he will be appointed Inspector General of Prisons in the Central Provinces

CAPTAIN T H FOULKES, I M S, is due back from leave on 3rd April 1905

CAPTAIN F F ELWES, I M S, acted as Surgeon to H E the Governor of Madras, during the absence of H E Lord Amphill as Viceroy

MAJOR C MACTAGGART, I M S, Inspector General of Prisons, United Provinces, has been permitted to return to duty

MAJOR T JACKSON, M B, I M S, is appointed to be Superintendent of Matheran, and is vested with the powers of a Magistrate of the first class

ON return from leave Lieutenant-Colonel Crimmin, V C, resumes his appointment as Health Officer of the Port of Bombay

MAJOR P HEHIR, M D, I M S, has taken over the civil medical duties of the Manipur State in addition to his military duties

ON return from leave Captain A M Fleming, I M S, was appointed Civil Surgeon of Chanda, C P

CAPTAIN G FOWLER, I M S, was appointed Civil Surgeon of Wardha, C P

CAPTAIN MEGAW, I M S, was appointed Civil Surgeon of Jalpaiguri, during the absence of Captain Delany, I M S

ON return from furlough Lieutenant-Colonel T Grainger, M D, I M S, was appointed Civil Surgeon of Mozufferpore, and Captain Cecil Stevens, F R C S, I M S, was appointed Civil Surgeon of Champaran District

CAPTAIN J W RAIT, I M S, was appointed Civil Surgeon of Dinapore, vice Captain G King, I M S, who has been put on plague duty in Bihar

LT COL L A Waddell, I M S, O I E, C B, was granted one year's leave Pension service, 25th year commenced on 16th May 1904

We congratulate Colonel Waddell, on his having got the C B, for his services in Tibet. This is the only honour awarded to the Medical Department for their exceptionally arduous work in Tibet.

THERAPEUTIC NOTES AND SANITARY APPLIANCES

MESSRS BURN & Co., Howrah, have become Agents for Messrs D & J Tullis, Ltd., the Steam Laundry Engineers of Scotland. From the description of the appliances made by their firm, it is clear that it would be of great benefit if the use of the steam laundry could be introduced into the big cities of India. A ride or drive through the environs of Calcutta, say on the road to the Tollygunge Club, will show the methods of the Calcutta *dhobies*. More and more tanks are being filled in and rightly so, but one result of this must be greater congestion of *dhobies* at the remaining *ghāts* and tanks and the greater filth of the water in which our clothes are washed. This is an important matter, and for this reason we direct attention to the new machinery for which Messrs. Burn & Co. are the Agents.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs Thacker, Spink & Co., Calcutta.

Annual Subscriptions to the *Indian Medical Gazette*, Rs 12, including postage, in India Rs 14, including postage abroad.

BOOKS, REPORTS, &c, RECEIVED

Punjab Administration Report.
Wellcome Laboratory, Khartoum, Report
Report of the Egyptian Medical School
British Guiana Medical Annual
Lt Col Gilles Climate and Health in Hot Countries (J Balch Sons and Danielson)
Dr W Pearce's Clinical experiences
Medical and surgical Landmarks
Inoperable Cancer (Shaw Mackenzie).

LETTERS, COMMUNICATIONS, &c, RECEIVED FROM —

Dr Watson, Selangor, Capt L Rogers, I M S Calcutta Lt Percival Mackie, I M S, Goona, Major Henry Smith, I M S, Jullundur Major D M Mair, I M S Chapra Capt. Clayton Lane, I M S, Calcutta, Dr W J Wainless, Toronto Dr C L Bose Calcutta, Capt Patton, I M S, Aden, Capt D McCay, I M S, Calcutta, Major Simpson I M S, Madras, Lt Col J Smyth, Mysore Capt W G Liston, I M S, Bombay, Lt Col D G Crawford, I M S, Hughli.

Original Articles.

SOME POINTS CONNECTED WITH LIVER ABSCESS AS SEEN IN CALCUTTA

By J W D MEGAW,

CAPTAIN, I M S,

On Special Duty at the Medical College Hospital, Calcutta

THE following notes are based on an analysis of a large number of cases of abscess of the liver, treated in the surgical wards of the Medical College Hospital, Calcutta, from the year 1895 onwards

The question of treatment will not be taken up, as it is hoped that a paper dealing with that subject will shortly appear in this Gazette, by a Surgeon who has a very large experience in the operative treatment of liver abscess

The pathology of the disease has already been fully discussed by Captain Leonard Rogers, I M S, whose paper was reproduced in the *British Medical Journal* of September 20th, 1902

This paper, which clearly shows that the great majority of cases of liver abscess in Bengal are secondary to amoebic dysentery, should be read by all who are interested in the subject, as many text-books tend to ignore the amoeba dysenteriae, as a cause of one form of dysentery, and of the resulting abscess of the liver

The available records of the cases treated are not uniform in completeness, and therefore in most cases only a proportion of the records gives information on any particular point. In each case the number of records searched, and the number giving definite details on any point will be stated

With regard to the influence of *Dysentery* as a cause of liver abscess, 224 records were searched, and a reference to dysentery was found in 150

Of these 34, or 18.8% gave a clear history of a preceding attack of dysentery in the course of which the symptoms of liver abscess developed

Twenty-three or about 12 per cent gave a history of dysentery, with a varying period of freedom from the disease, before the symptoms of liver trouble appeared

Seventeen or 9 per cent stated that dysentery appeared, either at the same time as the symptoms of the liver abscess, or after the onset of those symptoms

Five gave a history of dysentery, but there is no note as to the time of occurrence of the disease

On the other hand, 76, or more than half, stated that they had no knowledge of any attack of dysentery

The clinical evidence of the influence of dysentery in this connection is therefore not very convincing

Captain Rogers, however, clears up this point by showing that if the clinical and *post-mortem* records are taken in conjunction, there is evidence of dysentery in about 90 per cent of the cases

The *post-mortem* records of 50 cases were examined from this point of view, and I found that among 47 in which the intestine was examined, 37 showed distinct signs of recent or old dysentery

Taking up the question from a different standpoint, the notes of 64 consecutive *post-mortem* examinations of cases of dysentery were examined, and it was found that seven of these showed definite early abscess of the liver, while in many others the liver was described as being in an early stage of 'fatty' or 'cirrhotic' degeneration, and only in a few was it definitely described as 'healthy'

The religious and racial incidence is a point of considerable interest

The denomination of the patient is stated in 286 cases

Of these 220, or nearly 77 per cent, are Hindus, 37, or about 13 per cent, are Mahomedans, 24, or about 8 per cent, are Europeans or East Indians, and 5, or about 2 per cent, are Native Christians. The following table has been compiled for the purpose of contrasting the percentage of cases of liver abscess in the patients of the different classes, with the total number of surgical cases occurring among the same classes during the corresponding period --

	Hindus	Mahomedans	Others	Total
Cases of liver abscess	77%	13%	10%	100%
All surgical cases	52%	19%	29%	100%
Total population of Calcutta	65%	29%	6%	100%

In the above table it is clear that the admissions of Europeans and others for surgical affections in general, is far in excess of their due proportion

This is chiefly due to their greater readiness to come to hospital for minor affections, and in consequence the proportion of any severe affection like liver abscess, to all the surgical cases, is naturally much smaller in the case of Europeans, than in the case of Natives, among whom the more severe surgical affections predominate

For this reason the figures are also contrasted with those of the total population of Calcutta, and it becomes clear that liver abscess is at least as common among Europeans as among Natives of India

Even when this correction has been made, however, the number of cases of liver abscess

amongst Natives of Bengal is remarkably large, when contrasted with the number occurring in sepoys

The statistics of the Native Army have always been taken as showing that Natives of India are almost immune to liver abscess

The figures given above show clearly that there is no inherent immunity in Natives, and it is probable that the temperate habits of the sepoy, both in food and drink, are the most important factors in giving him comparative exemption from the disease

The relative frequency of the affection in Hindus and Mahomedans is much more clearly shown when the figures for these classes are considered separately

Of 257 cases, 220 were Hindus, and 37 Mahomedans, a ratio of 6 to 1

During the same period the ratio of all surgical cases was 2.66 Hindus to 1 Mahomedan, and the total population of Calcutta showed a nearly similar ratio of 2.25 Hindus to 1 Mahomedan

It is therefore evident that the Hindus and Mahomedans come to hospital in numbers nearly proportioned to their total strength, so that the criticism applied to the figures for Europeans does not hold in their case

There appears then to be a relative immunity among the Mahomedans. This may be accounted for by the Mahomedans being forbidden by their religion to take alcohol

It is to be regretted that this prohibition is not by any means universally observed by the lower class Mahomedans of Bengal, for if it were, we would have an excellent opportunity of comparing the incidence of liver abscess among two classes of the community living side-by-side, the one of whom does not take alcohol, while the other is in the habit of using it

Sex—Out of 278 cases, only ten were females, of these seven were Hindus, two were Europeans or East Indians, and one was a Mahomedan. The latter, curiously enough, gave a history of addiction to alcohol

The number of females treated during the same period for all surgical affections was about one-fifth of the number of males, while the number of females treated for liver abscess was only one-twenty-eighth of the number of males

Liver abscess, therefore, would appear to be much more common in males than in females

Age—The age incidence is based on 226 cases

Of these only eight were 20 years of age and under

The youngest recorded is a Mahomedan boy of 17 who had a supra-hepatic abscess

The two oldest cases were (1) a European male of 63, who recovered in six weeks, after the evacuation of 12 oz of pus, (2) a Hindu male of 60, whose abscess was freely opened, and 28 oz of pus evacuated, death following two months after the operation

The following table shows that, as seen in this hospital, the disease is essentially one of early manhood, it is rare in youth and old age, and not seen in childhood

AGE INCIDENCE OF LIVER ABSCESS

20 years and under	8 or about 3.6 per cent.
21-30 inclusive	97 " 42.9 "
31-40 "	77 " 34.4 "
41-50 "	37 " 16.4 "
over 50 "	7 " 3.1 "
Total	226 " 100 "

Malaria—Neither the clinical nor the *post-mortem* records contain any evidence that malaria has a special influence in causing liver abscess

The condition of the spleen is often noted, but it is seldom described as being enlarged to any marked degree

Alcohol—A note is made regarding alcohol in 170 cases out of 229 of the 170, 119, or about 70 per cent, gave a history of the habitual use of alcohol in some form, while 51, or about 30 per cent denied having been accustomed to take alcohol

If an allowance is made for a natural hesitancy on the part of some, to confess to a habit which is not considered respectable by the better class of natives, the proportion of those who were accustomed to take alcohol is large

The rarity of liver abscess among the more temperate sepoys and among the more generally temperate female sex, together with the lesser prevalence among the relatively temperate Mahomedans of Bengal, are facts which point strongly to alcohol as being an important factor in causing the disease. It is, of course, well known by all who have much experience of the inhabitants of Calcutta, and of the Natives of Bengal generally, that they are not by any means so temperate in their habits as the native of India is generally described as being. Especially in Calcutta, the lower classes are comparatively well off, and many of them spend a considerable proportion of their income on alcohol

There is a sufficient strong case against alcohol to make it advisable for any one who has suffered from dysentery to be extremely sparing in the use of alcohol, so long as there is any suspicion of his bowel being in an unhealthy condition. In this connection it must be remembered that amebic dysentery is liable to be a very insidious affection, and to give rise to very trifling symptoms, even when the colon is markedly damaged

Social position —The better class Hindus and Mahomedans are sparingly represented, but the information regarding the occupation of the patients is so vague, that it is not possible to make any definite statement as to the relative incidence among the different social grades

Earliest symptoms —In 195 cases out of 224, the earliest symptoms are noted

Fever was stated to be the first symptom in 67 cases, and in most of these there was pain within a few days of the onset of the fever

Pain and fever came simultaneously in 56 cases

Pain alone was the first symptom in 40 cases

Pain and swelling were the earliest symptoms in fourteen cases

Fever, pain and swelling occurred simultaneously in seven

Swelling alone was noticed in seven, and fever and swelling, in four. Fever and pain are thus the earliest indications of the disease in the great majority of cases

In nearly all the cases in which a note is made on the subject, the fever was intermittent, coming in the afternoon or evening, and passing off after a few hours with sweating. It is probable that in no case was fever absent throughout the course of the illness, though in some cases it was absent for a time

In one or two cases in which there was a definite statement that there had never been any fever, the patient was found to have distinct pyrexia on the day of admission. The pain was usually referred to the liver region, and nearly always on the right side. It was seldom localized in the right shoulder, though the point was often enquired into

Physical signs —Nearly all the cases were admitted at an advanced stage of the disease, when there could be little doubt as to the diagnosis, so that the information regarding the physical signs is not of much value. A fulness over the region of the right lobe of the liver, or in the epigastric, or right hypochondriac region, is nearly always mentioned, and there was an enlargement of the liver to a varying distance below the costal margin in the right nipple line in almost all of the cases. There was also very commonly an increase in the liver dulness upwards in most of the cases. There was usually tenderness of the affected part, and sometimes œdema of the skin. The patient was generally much wasted, weak and anæmic, and had a muddy complexion. Actual jaundice is seldom mentioned

Prognosis —Of 292 cases, 108 were discharged cured, 34 were discharged, relieved, at their own request, eight were discharged at their own request, no note having been made of their condition on discharge, 142 died in hospital

There is thus a proved mortality of nearly 50 per cent, and it is probable that a fair proportion of those discharged at their own request, died after discharge, so that the mortality may be taken as about 60 per cent. It must, however, be remembered that the great majority of the cases were admitted in a very enfeebled condition, owing to the dread of a surgical operation being so great among the natives of Bengal, that they will not come for operation till they have tried all the varieties of remedy offered by the country practitioners, and till they have drifted into a condition in which even the quacks can no longer hold out hopes of recovery

The above death rate occurred in spite of the promptest surgical treatment, which in most cases consisted in free incision and drainage, part of a rib being resected when necessary

In a few cases aspiration was at first tried, but only as a temporary expedient, and the general consensus of opinion among the various operators was distinctly in favour of prompt incision and drainage

Post-mortem appearances of the fatal cases —An examination of the 50 available *post-mortem* records, showed that the abscesses were of the following descriptions —

Twenty were single large abscesses of the right lobe

Seven were single large abscesses with one or more additional smaller abscesses

Eleven were single large abscesses, with numerous small abscesses

Three were multiple fairly large abscesses

Three were numerous small abscesses

Four were perihepatic single abscesses

Two were perihepatic abscesses, with secondary small abscesses

The following cases of rupture of the abscess were noted *post-mortem* in the same series of cases —

Three ruptured into the right pleura

Two into the right lung

Two into the peritoneum

One into the inferior vena cava

In six cases there were secondary abscesses in the right lung, without any visible communication with the abscess cavity in the liver

Two cases were direct extensions of post colic abscesses, which were associated with dysenteric ulceration of the ascending colon

In ten cases the colon was adherent to the under surface of the liver, and in most of these cases there was sloughing ulceration of the bowel at the site of the adhesion

A table of 25 cases in which both clinical and *post-mortem* records are available, is appended, showing in parallel columns some of the outstanding features of a representative series of fatal cases

Table showing the Outstanding Features of Twenty-five Fatal Cases of Liver Abscess, treated at the Medical College Hospital, Calcutta

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Age	Sex	Race	Occupation	Residence	History of Alcohol	History of Dysentery	Early Symptoms	Local Signs	Operation	Amount of Pus	Survival after Operation	Condition of Abscess (Post-mortem Report)	Complications	Large Intestine, Signs of Dysentery
30	M	H	Cook	Calcutta.	A	No D	Fever 6 months ago	Swelling in R. hypochondrium	Incision below O M	Much.	15 d	Single, occupying 1/2 of right lobe	Localized rupture into peritoneum	Nil
40	M	H	Milkman	24 Perganas.	A	D 10 days ago	Pain 1 1/2 months.	Fluctuating swelling	Incision below C M	20 oz	3 d	Single, 4 inches diameter, right lobe	20 oz. clear fluid right pleural C	Numerous recent ulcers and scars
30	M	H	Nil.	Shanarpur	A	No D	Swelling, 1 month	Fluctuating swelling	Aspiration	50 oz.	2 d	Single, 55 oz pus, right lobe	22 oz. clear fluid in abdomen	Scars of recent ulcers
29	M	H	Silversmith	Mogra.	A	No D	Fever and pain, 20 days	Swelling in R. hypochondrium	Incision, 8th space.	20 oz.	8 d	One large in right lobe, numerous, small	Rupture to right pleura	Sloughing ulcers
30	M	H	Cowman	Calcutta.	A	No D	Fever 12 days	Fluctuating swelling	Incision, 8th space.	28 oz.	60 d	Three large, right lobe	Hepatic flexure adherent to liver	Sloughing ulcer in rectum
60	M	H	Cooly	Calcutta.	A	No D	Fever 1 month	Fluctuating swelling	Aspiration and incision	48 oz.	1 d	One large and numerous small in left lobe.	Transverse colon adherent to liver	Sloughing ulcers, caecum and colon
40	M	H	Nil	?	No A.	No D	Fever 12 days	Fluctuating swelling	Incision, 8th space.	60 oz.	21 d	One enormous in right lobe	Rupture into right lung	Ulcers and scars all over colon
25	M	H	Shopkeeper	Calcutta	A	No D	Fever 1 month	Fluctuating swelling	Incision, 8th space.	10 oz.	1 d	One large, right lobe	Adhesion between liver and transverse colon	Scattered ulcers, colon
30	M	M	Cultivator	Calcutta	No A	D 15 years ago	Fever 6 weeks, pain and swelling	Fluct. swelling	Incision, 8th space.	32 oz.	20 d	One lower part of right lobe	Ascending colon adherent to liver	Extensive ulceration, caecum and asc. colon
50	M	M	Cultivator	Calcutta	No A	No D	Fever and swelling	Fluct. swelling	Incision, 8th rib	20 oz.	2 d	One perihepatic (upper surface)	Ascending colon adherent to liver	Small scars and healing ulcers sigmoid.
22	M	H	Cultivator	Calcutta	A	D 2 years ago	Fever and pain, 2 months	Swelling in epigastrium	Incision, 8th rib	04 oz.	25 d	Numerous medium sized throughout liver	Ascending colon adherent to liver	No ulcers
25	M	M	Sailor	Howrah	A	No D	Fever 2 months, pain 5 weeks	Swelling in epigastrium	Incision, 8th rib	?	40 d	One large, supra hepatic, one large right lobe	Ascending colon adherent to liver, rupture to R. pleura.	No ulcers (mucus in colon)
40	M	M	Shopkeeper	Siliguri	A	No D	Pain, 1 month	Swelling	Resection 7th rib	?	39 d	Single size of hen's egg, right lobe	Transverse colon adherent to liver	Scars in caecum
58	M	M	Goldsmith	Calcutta.	No A	No D	Fever 1 month.	Liver 2 1/2 lbs below C M	Aspiration	?	4 d	Large single right lobe	Secondarily abscess, right lung	No ulcers
38	M	M	Writer	Howrah	No A	D 2 months ago	Fever and pain, 6 months	Liver 2 1/2 lbs below O M	Resection, part of 8th rib	1 d	1 d	Large single, right lobe	Pneumonia and peritonitis	Numerous sloughing ulcers all over colon
30	M	H	Nil	Calcutta.	No A	D 4 months ago	Pain 4 months, swelling, 1 month	Liver 1 1/2 lbs below O M	Incision after 2 aspiration	Much pus.	11 d	Large perihepatic, over right lobe, 3 small intra hepatic	Rupture into portal vein	Numerous sloughing ulcers all over colon
37	M	H	Nil	Calcutta	A	No D	Swelling, 8 days	Swelling	Partial resection rib	Much pus	10 d	Large single right lobe	Empyema (right side).	Sloughing ulcers in hepatic flexure
50	M	M	Nil	Calcutta	A	No D	Pain 3 months, swelling 1 month	Swelling	Incision	?	9 d	One large right lobe numerous small throughout.	Empyema (right)	Numerous scars of old ulcers, colon and rectum
40	M	M	Contractor	Calcutta	A	D 15 days ago	Pain 3 months, swelling 1 month	Swelling	Incision 9th space	64 oz	23 d	One large, right lobe, numerous, secondary.	Hepatic flexure adherent to liver	A few small ulcers and scars
28	M	M	Servant	Calcutta	A	D 3 months ago	Fever and pain 1 month	Tender swelling	Incision with resection of rib	20 oz	9 d	Large single filling half of right lobe	Rupture into peritoneum	Numerous small ulcers, ascending, colon
20	M	H	Clerk.	Calcutta	No A	D 6 months ago	Pain, 3 months	Swelling	Aspiration	50 oz	72 d	One in front and upper part of right lobe		
40	M	M	Cultivator	Calcutta.	No A	D 7 years ago	Fever 1 year	Swelling	Incision with resection of rib	50 oz	9 d	One in back and one in upper part of right lobe		
30	M	M	Servant.	Calcutta	No A	D 2 months ago	Swelling and pain, 23 days	Swelling	Aspiration	25 oz	9 d	One large right lobe, one small left lobe		
30	M	M	?	Calcutta	No A.	D 2 months ago	Fever 1 month, swelling 20 days	Swelling in epigastrium, liver 3 1/2 lbs below C M	Incision	Much	17 d	One large (3 of right lobe)		
25	M	M	Grocer	Calcutta	No A.	D 2 months ago	Fever and swelling 1 month	Swelling	Aspiration	?	?			

Abbreviations: Col. 2.-M = Male. Col. 3.-H = Hindu. Col. 4.-A = History of Alcohol. Col. 5.-E = Eurastan. Col. 6.-A = History of Alcohol. Col. 7.-D = History of Dysentery. Col. 8.-G = The costal margin in the right nipple line. Col. 9.-G = The costal margin in the right nipple line. Col. 10.-A = History of Alcohol. Col. 11.-D = Days.

VACCINE LYMPHS IN THE PUNJAB *

BY W F HARVEY, M A M B, D P H,

CAPTAIN, I M S,

Deputy Sanitary Commissioner, Punjab

IN April of last year I submitted a report dealing with the respective merits of glycerinated and vaselinated vaccine lymph. In that report I recommended that the former should take the place of the latter in the Punjab. As the evidence for the desirability of this step was not considered complete, I was asked to submit a further report. I have the honour now to present extended observations and further experiments which I think will entirely remove any doubts as to the advantages to be derived from the use of glycerinated lymph. This lymph has been in use now by Government public vaccinators in England for some years. When one considers the nature of the climate of the Punjab in the cold weather one would expect that the procedure which had found favour at home would be completely applicable in this part of India, and so it is found to be. Before submitting the evidence in favour of this conclusion I should like to point out briefly what has been the course of development of vaccination in the Punjab.

Development of Vaccination in the Punjab

Nine or ten years ago almost all vaccination was carried on from calf to arm or from arm to arm. Vaccination operations were suspended during the hot weather owing to the effect which heat had upon the vaccine. It was necessary, therefore, to maintain a supply of lymph in a cool climate, which should be available to start vaccination again in each district at the commencement of the cold weather. This supply was preserved at Murree by transference of lymph from calf to calf with the occasional inclusion of a passage through the human being when the lymph appeared to be deteriorating. The lymph supply thus maintained throughout the hot weather and which was to be used to start vaccination operations in the province was sent out in September in capillary tubes. From this buffalo calves were vaccinated and from these again other calves according to the necessities of the district, which became from that time onwards self producing. But the month of September is still very hot in the Punjab, and the consequence was that many failures occurred. In certain cases lymph had to be repeatedly sent out from Murree, sometimes as many as six times until at last a successful result was obtained. This method too is clumsy and full of difficulties of application even after the supply has been established. Five or six days have to elapse before the calves are ready to supply lymph, and if sufficient children are not forthcoming on the appointed day part of the yield from any given calf is wasted. These difficulties still prevail in districts. It was under such circumstances that Lieutenant Colonel Bamber, I M S, in 1895 introduced the method of mixing vaseline with the lymph—thus diluting it but at the same time evidently conferring upon it a capacity for resistance to external influences (climatic) not possessed by the undiluted lymph. Nor was the efficacy of the lymph for vaccination in any way impaired. Failures in the "annual supply" now became exceedingly few in number, and it was evident that a very great advance had been made on previous methods.

Originally it was expected that vaseline, like glycerine—although in a different way—would cause the disappearance from the vaccine lymph of the undesirable extraneous organisms. This action, however, did not take place.

Nevertheless I think it will be admitted that vaselinated lymph at the time of its introduction afforded a very great improvement and advance upon older methods, and although I would now advocate its supersession by

chloroformed glycerine lymph, it is only as a more perfect method supersedes a less perfect one.

Rationale of the use of Diluent and Preservative Media for Vaccine Lymph

The ruling idea, I believe, in the use of vaseline as a diluent was that as it contained no oxygen, life could not be supported in such a medium, and extraneous organisms would as a consequence die out from the lymph. As a matter of experience and test, it is found that the foreign organisms do not die out but actually multiply and increase. The reason for this is probably that in the process of manufacture a sufficiency of air becomes mixed with, and imprisoned in, the vaseline and life is thus rendered supportable. But in any case there are certain organisms which can live and multiply in the absence of oxygen (anaerobic). On the whole, I think that if such a predicament presented itself as an obligatory choice between a medium affording facilities for aerobic (presence of air or oxygen) growth of organisms and another affording facilities for anaerobic (absence of air or oxygen) growth I should prefer to be responsible for the utilisation of the former rather than the latter. Much more so then would a medium, which while devoid of any inhibitory effect *per se* upon organisms yet afforded conditions suitable for both aerobic and anaerobic growth, be prohibited from use. Unfortunately it is under this category that we must place vaseline. Lanoline, on the other hand, itself contains oxygen, but, as far as I am able to ascertain, like vaseline, possesses no inhibitory or lethal effect upon the extraneous germs of vaccine lymph. Thus in the case of lanoline also the aerobic growth of organisms proceeds unchecked until the food-supply is exhausted. Glycerine too contains oxygen, but in virtue of its specific effect on micro-organisms (an effect not yet fully explained) no discernible multiplication of organisms takes place in the vaccine pulp with which it is mixed. Those organisms already present in the lymph are slowly but surely killed off. For this reason glycerine is greatly to be preferred to either vaseline or lanoline, provided other disadvantages connected with its action upon living organisms (of which the vaccine virus must be held to be one) do not debar it from use. In this report I hope to be able to show that in comparison with vaseline at least, it possesses no disadvantage. It should here be mentioned that the lymph used in calf to arm vaccination (so called "pure lymph") particularly as obtained in this country is by no means free from micro-organisms, and that the organisms which can be demonstrated in vaselinated and lanolinated lymphs are actually the organisms contained originally in vaccine pulp.

The action of the various substances mentioned—vaseline, lanoline and glycerine—upon the foreign organisms contained in lymph can be easily shown in the following way. Each lymph (vaselinated, lanolinated and glycerinated) is kept under the same conditions, that is to say, for the same length of time and at the same temperature. At the end of the given time equal quantities of each form of lymph are separately introduced into a liquefied food medium contained in a test tube and then this in each case is poured out upon a special kind of plate (Petri's dish). The medium then solidifies. Each single germ or group of germs which was contained in the portion of lymph originally introduced into that medium, proceeds to grow and form a colony. As these colonies are visible to the naked eye, they can be counted and in that way an estimate formed of the number of germs which gave rise to them—that is to say, the number of germs which were contained in the quantity of lymph which was added to the food medium. I must apologise for describing in detail the simple bacteriological process of estimating the number of organisms contained in any material, but I have done so in order that what follows may be fully intelligible to all.

Incubation was for 24 hours only in each case. Temperature 37° C. One loopful of each kind of lymph was plated.

* Being a Report, submitted to the Sanitary Commissioner, Punjab—ED, I M G

Lanolinated lymph after a fortnight's storage
 Number of colonies innumerable
 Glycerinated lymph after a fortnight's storage
 Number of colonies—29
 Glycerinated lymph after a month's storage
 Number of colonies—30
 Vaselineated lymph after a month's storage
 Number of colonies innumerable
 Lanolinated lymph after a month's storage
 Number of colonies innumerable

It need scarcely be added that the presence of any foreign germs in vaccine lymph is undesirable. When they occur in such numbers as in vaselinated and lanolinated lymphs they render these vaccines distinctly dangerous to use.

Results establishing the efficacy of Glycerinated Lymph, together with a comparison of the results of Glycerinated Lymph and Vaselineated Lymph

As has already been pointed out, the "Annual Supply" of lymph is sent out at a time of the year when the temperature in the plains is still high. The results of this particular supply therefore form a very severe test of the quality of the various lymphs used. Under the circumstances which prevail at this time, the lymph is not stored but sent out almost fresh. This point—the time after preparation within which the lymph is used—is an important one. The results given in many reports are quite useless for comparative purposes owing to the omission to state at what period (or average period) after preparation the lymph came to be used. In the case of this year's "Annual Supply" I give only the results with glycerinated lymph, for the vaselinated lymph which was issued along with it failed almost in every case. This last was due, however, I think, to preventable causes and not to inherent defect.

"Annual Supply"—Glycerinated Lymph

Average number of days after preparation within which lymph was used	Number of persons vaccinated	Case Success	Insertion Success
65	1,298	91.52%	76.06%

In gauging the success of this supply, the temperature at that time of the year (September) has particularly to be kept in mind.

Vaccination Success is stated as a percentage, viz., the percentage of the total number of persons vaccinated who have shown two or more vesicles. "Unknown" cases are excluded from the calculation.

Insertion Success is the ratio of the number of vesicles produced to the number of insertions made. It also is expressed as a percentage.

Another well defined lymph supply is that issued to the special staff for use in the hills during the hot weather. In this case it is possible to compare glycerine and vaseline. The former gave a "Case Success" of 99.35% and an "Insertion Success" of 93.19%, the latter a "Case Success" of 97.14% and "Insertion Success" of 85.50%.

Glycerinated Lymph used in the hills during the hot weather

Average number of days after preparation within which lymph was used	Number of persons vaccinated	Case Success	Insertion Success
21.18	1,098	99.35%	93.29%*

* Note the difference between glycerinated and vaselinated lymphs as regards "Insertion Success."

Vaselineated Lymph used in the hills during the hot weather

Average number of days after preparation within which lymph was used	Number of persons vaccinated	Case Success	Insertion Success
19.52	3,384	97.04%	85.50%*

But as the greater part of the vaccination in the Punjab takes place during the cold weather, the results obtained during this season are perhaps the most important. Out of the various supplies issued I select that for the special staff, because these vaccinators form a body of men who are now well trained in the use of glycerinated and vaselinated lymphs and because I was able to inspect samples of their work in every district but one, and that was inspected by the Sanitary Commissioner himself.

The results were as follows—

Vaccination with Glycerinated Lymph during the cold weather

Average number of days after preparation within which lymph was used	Number of persons vaccinated	Case Success	Insertion Success
21	16,883	99.17%	94.97%

Vaccination with Vaselineated Lymph during the cold weather

Average number of days after preparation within which lymph was used	Number of persons vaccinated	Case Success	Insertion Success
22	7,261	98.58%	92.41%

It will be seen that in point of "Case Success" in all these statistics glycerinated and vaselinated lymphs differ but slightly. The "Insertion Success," however, gives a much better criterion of the comparative values of lymphs and from this it will be seen that glycerinated lymph shows a superiority over vaselinated lymph.

But it may be objected that these results—owing to the comparative freshness of the lymph—were not a test of its keeping powers. However, experiments specially performed and which I will presently detail serve to set aside this objection by illustrating the satisfactory keeping properties of glycerinated lymph. We may conclude now, I think, from these results that, under the conditions of climate and time within which they were used, glycerinated lymph bears no unfavourable comparison as regards successful vaccination with vaselinated lymph. I may now proceed to the consideration of certain experiments performed at Kasauli, with these two lymphs and also certain other important points which were elucidated at the same time.

Duration of efficacy of Glycerinated Lymph and means of preservation

A good deal of stress has been laid on the fact that glycerine attacks the vaccine virus and renders it inert. That this action cannot be a very energetic one is shown by the fact reported in one of the Local Government Board's Reports (1897-98) that glycerinated lymph has given 100 per cent "Insertion Success" at the end of ten months. Here, no doubt the lymph had been placed under the most favourable conditions for preservation (cold storage, uniform temperature, &c.) But if we subject the various rival forms of lymph to

adverse influences in a controllable form, we shall see at once whether the action of glycerine will impair the activity of the vaccine virus to an extent which places that form of lymph in an inferior position to the others. I have carried out experiments to clear up this point in the case of glycerinated and vaselinated lymphs. A full investigation would require the trial of lanolinated lymph, of "pure fluid" lymph, and of dried lymph (on points or in powder). The actual experiments performed will be detailed under the heading "Effect of Heat". As regards duration of efficacy, the further period over two months up to which glycerinated lymph or any other lymph will remain efficacious is a matter of scientific interest but not of very great practical importance.

According to the estimate of the Chicago Health Department 50 to 60 days are required to purify glycerinated lymph which will then remain fully potent for 40 to 50 days longer or 100 days in all. Trials were made, with lymph carefully prepared at Kasauli, as to the duration of activity of glycerinated and vaselinated lymphs. These were used in the immediate neighbourhood (Kasauli and Sanawar) and also at Quetta, Peshawar and by the special staff. Up to the time of use or despatch the lymph was kept at a temperature under 10°C (50°F). The results, as will be seen from the tables, were very satisfactory in the case of glycerinated lymph.

Glycerinated and Vaselinated Lymphs tested side by side. Previously stored at under 10°C

Kind of Lymph	Average number of days after preparation within which lymph was used	Number of persons vaccinated	Case Success	Insertion Success	REMARKS
Glycerinated Lymph	19	76	100%	95.96%	The lymph pulp for each form of lymph was obtained from the same calf
Vaselinated Lymph	22	100	82%	73.67%	

Here where lymph from the same calf was used—in the one case glycerinated, in the other vaselinated—even after so short a period as three weeks glycerinated lymph showed distinct superiority.

The following table gives the maximum limits of duration of efficacy of glycerinated lymph hitherto tested.

Glycerinated Lymph used 80 days or more after preparation

Average number of days after preparation within which lymph was used	Number of persons vaccinated	Case Success	Insertion Success
87.7	286	97.20%	95.10%

Even 80 days after preparation 97.20 per cent of "Case Success" can be obtained with carefully prepared and carefully used glycerinated lymph and the "Insertion Success" approximates very closely to the "Case Success". In short, it is not mere contact with glycerine, which is destructive to vaccine lymph but *prolonged* contact.

Effect of Heat—In my last report I pointed out that as far as results showed and a limited number of experiments demonstrated heat had a more deleterious effect upon vaselinated lymph than upon glycerinated lymph. A repetition of these experiments served only to confirm the previous statements. Thus lymph pulp was obtained from one calf, divided into equal portions, the one half glycerinated, the other half vaselinated. These were each placed in an incubator at 37°C for definite periods, and then used for the vaccination of a calf with the following results—

Results of lymphs incubated at 37°C for four days—

(a) Glycerinated lymph gave fairly good results with rather small vesicles.

(b) Vaselinated lymph failed entirely.

This experiment, however, contains a fallacy. The lymph used was eleven days old. By this time under the action of glycerine the extraneous organisms have to some extent disappeared. Under the action of vaseline no such disappearance would have taken place. When placed in the incubator the extraneous organisms would multiply and increase enormously in vaselinated lymph, but would not do so in the case of glycerinated lymph. Thus the failure of the vaselinated lymph may have been due to overgrowth of foreign organisms.

When removed from the incubator it was evident from the odour that fermentation had taken place in the case of the vaselinated lymph, and this no doubt in part accounts for its failure under such circumstances.

The same two lymphs which were the subject of this experiment were—unincubated—issued as controls for use in Peshawar with these results—

Kind of lymph	Number of days after preparation within which lymph was used	Number of persons vaccinated	Insertion Success
Glycerinated	20	29	95.9%
Vaselinated	20	61	93.8%

Occasionally returns come in with the remark opposite a vaselinated lymph tube "turned bad" thus—

Kind of lymph	Date of preparation	Date of use	Number vaccinated	Insertions	RESULTS							
					Number of vesicles.							
Vaselinated Tube No 856	4th Dec 1903	5th Jan 1904	35	208	30	6	5	4	3	2	1	0
Ditto 857	Turned bad	Re turned	20th Feb 1904									

This never happens in the case of glycerine. When the medium used for dilution of the lymph is not also inimical to the growth of micro organisms, then if the temperature and moisture conditions be suitable, fermentation and putrefaction will occur if any germs are left in the lymph. This must always remain an insuperable barrier to the use of vaseline, even supposing it were possible to remove most of the contaminating germs by the use of chloroform. The suggestion too that vaseline might be used as a medium to mix with the lymph after it had undergone the chloroform process is not entertainable for another reason, *viz.*, that water is required for this process and water and vaseline will not mix. At a low temperature glycerine acts but slowly upon the extraneous organisms of lymph and it may be presumed that it acts still more slowly

under these conditions upon the vaccine virus. Therefore, if we can get rid of these foreign germs by a rapid process the preservation of the lymph even in a glycerinated medium will be ensured for a long period by keeping it at a low temperature. The objection to keeping the glycerinated lymph in ice—before the introduction of the chloroform of the process which I shall presently refer to—was that although the keeping powers were increased the purification was retarded. With the rapid process now available all that is requisite is that the lymph be used within a reasonable time after receipt by the vaccinators. Then the glycerine will act merely as a preventive to the growth of the few organisms remaining and not attack the vaccine virus, during period of storage at low temperature.

In the remarks appended to last year's report it was suggested that experiments might be performed subjecting lymph to a temperature of about 57° C for five minutes with a view to getting rid of extraneous organisms. I have not performed these experiments because the published results of this process show that the extraneous organisms are not by any means got rid of entirely. It presents therefore no prospect of being an improvement on the chloroform process and in regard to the facility it would afford for admixture afterwards with vaseline, the same objection holds good here which I have already formulated; viz that vaseline is not a suitable medium to use as long as any organisms which would be capable of multiplication, remain in the lymph.

Treatment of Lymph by Chloroform

It was at the suggestion of the Sanitary Commissioner that I commenced the trial of the effect of chloroform upon vaccine lymph—after the method published by Dr A. B. Green in the Local Government Board Report (1900-01) and later in the transactions of the Royal Society. The results have been most satisfactory. The method is as follows. The lymph pulp is ground up and mixed with sterile water. Chloroform vapour is then passed through the mixture at a uniform rate for 3 to 6 hours when it is stopped and filtered air is passed through in order to displace the chloroform from solution. We have left then a suspension of vaccine pulp in water and free from any preservative. It is found that at the end of 3 hours almost all the extraneous organisms have been destroyed. But spore bearing forms are not destroyed. Sometimes too micrococci are left alive. Nevertheless the purification effected by chloroform in 3–6 hours seems to be equal to that effected by glycerine in a month—a very great saving of time. The following figures illustrate the rapid purification which occurs by the chloroform process. More colonies would have appeared in the chloroform plate if more than 24 hours' incubation had been given. But as all the plates illustrating this report have had the same period of incubation a more or less strict comparison is permissible amongst them all.

Incubation of plates 24 hours at 37° C

Before treatment with chloroform Colonies innumerable

After 3 hours' treatment with chloroform

Number of colonies—1

Lymph treated by this process can be issued on the same day as it is removed from the vaccinifer. There is no tedious waiting for the elimination of foreign germs with liability to deterioration of the vaccine. Still the limitations of this process are exactly the same as those of glycerine itself. Certain of the more resistant bacteria are not destroyed. It becomes necessary therefore to add something to this watery emulsion which will act as a preservative. For this purpose there is no better substance than glycerine. I have previously pointed out that glycerine at a low temperature very slowly affected the vaccine virus. But at the same time extraneous organisms were only slowly destroyed at this tempera-

ture and purification delayed in consequence. Now we are enabled to purify our lymph first with chloroform and mix it with glycerine afterwards—the glycerine acting then, not as a purifier but as a protective. As I have already said, the suggestion that after purification by chloroform, vaseline might be mixed with the lymph is an idea not to be entertained. The organisms left untouched by the chloroform would in a vaseline medium always be liable to grow and multiply, and considering that certain pathogenic organisms are not destroyed by the chloroform it is essential that we should use a substance which shall carry on the inhibition already effected or further reduce the pathogenicity of these organisms. Even, although they were rendered non-pathogenic by the action of the chloroform it behoves us to prevent the possibility of their reacquiring virulent properties. At present we have not a better medium than glycerine for this purpose. In practice and as the result of experiment it has been found to be immaterial whether we add the glycerine to the lymph pulp before or after the passage of chloroform. The chloroform does not seem to be greatly affected in its activity by the presence of the glycerine; the extraneous organisms disappear to practically the same extent in a glycerinated lymph as when a watery emulsion is used. Lymph, which has been chloroformed and glycerinated, will keep under suitable conditions for three months, that is to say, for as long as lymph which has been glycerinated only will keep. The various statements regarding the action of chloroform on micro organisms are illustrated in the following table—

	Freshly prepared	Two weeks after preparation	One month after preparation
Method of treatment.	Number of colonies	Number of colonies	Number of colonies
1 Glycerinated and then chloroformed for 3 hours	8	0	8
2 Chloroformed 3 hours and then glycerinated	8	3	Not plated
3 Glycerinated only	Innumerable	750*	92*
4 Chloroformed only (in watery medium)	1	0†	Innumerable
5 Water only	Innumerable	Innumerable	Innumerable

Explanation }—C M M of the emulsion of lymph was plated in each case. During the interval between preparation and plating the lymph was kept in an ice chest at a temperature of 8° to 10°C. After plating the plates were kept for 48 hours at 37°C and 72 hours at 22°C and then the colonies counted.

These results are very interesting. They show that—

- There is but little difference between lymph which has been glycerinated before and that which has been glycerinated after being chloroformed.
- After chloroforming practically no further purification is effected by glycerine when the lymph is kept at a low temperature.
- Lymph which is glycerinated only and kept at a low temperature will become purified but slowly.

* The fact of the lymph having been kept at a temperature under 10°C explains the large number of micro organisms still remaining. At room temperature, at the end of two weeks an average of about 90 colonies is usual in simply glycerinated lymph.

† The increase of colonies in this lymph, although kept at a low temperature, is owing to the absence of any preservative. Certain microbes can multiply at this temperature under 10°C.

- (d) Lymph which has been chloroformed only and had no preservative added will show a great and rapid increase of micro organisms at the end of a month even although, kept at a low temperature

The organisms in lymph which are perhaps most to be feared are the staphylococci and streptococci. Other, pathogenic organisms, such as those of tetanus and malignant oedema, can with care be absolutely excluded from lymph, and even if they were introduced it is excessively unlikely that they could multiply or produce their effects seeing that they require anaerobic conditions to enable them to do so.

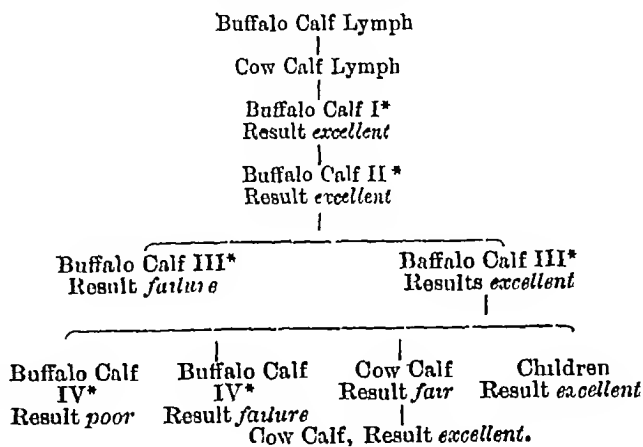
Staphylococci and streptococci each in pure culture in broth were subjected at room temperature to the action of chloroform. The cultures were of 24 hours' growth. It was found that while streptococci were killed by 6 hours' treatment with chloroform, staphylococci were not. In other words, these latter possess considerable powers of resistance to the action of chloroform. This fact constitutes a further argument in favour of the use of glycerine as a medium, for it is powerfully inhibitive to growth.

Vaccinifers and Degeneration of Lymph

The fact having been established that lymph of good quality and reasonable keeping powers is obtainable, the way would seem to be clear to the establishment of a central depot which would supply lymph to the entire Punjab and possibly the North-West Frontier Provinces as well. Proposals to this end form the subject-matter of a separate report. A point which has an important bearing on the establishment of a central depot is the question of the vaccinifer to be used, and whether it is procurable in sufficient numbers and whether it gives a good lymph supply. In my last year's report I stated that the opinion was prevalent that lymph which had passed through two or three buffalo calves underwent degeneration, and I expressed a certain amount of doubt as to the truth of this opinion. As the result of careful trials, I find that my doubts were unfounded and that degeneration does occur. This necessitates that stock lymph which is to be used for vaccinifers should be revived from time to time. With the cow calf this degeneration does not occur (according to the Superintendent of the Bangalore Institute), and it will be necessary to utilise this animal for the supply of stock lymph. Hitherto rejuvenescence of lymph has been effected by passing it through human beings from whom in turn calves are vaccinated direct. This method is certainly effectual, but it is clumsy, precarious and distasteful to the persons concerned. Another way of obtaining stock lymph was to send to Bangalore for it where cow calves only are used and the lymph in consequence does not degenerate. This supply too is precarious and often attended with serious delays. There remains therefore only the method of keeping up our stock by the vaccination of a cow-calf once a fortnight or thereabouts. This lymph would be kept for this purpose only, and would not be used to vaccinate any person who could possibly raise objections. As a matter of fact, cow calves are used as the only source of lymph in Mysore and Madras, and also I believe in other provinces of India. The Punjab seems to form the only exception. The cow-calf is much more easily procurable than the buffalo calf, is received at a more suitable age, gives better lymph and the lymph requires no reviving. I hope that in course of time the opposition to its use will disappear.

The following detailed experiment serves to bear out the statements made above regarding degeneration by passage through buffalo calves and illustrates how when lymph has begun to deteriorate, it may be reactivated by passage through the human subject or cow calf. The table shows successive passages of lymph through calves in the form of a genealogical succession. Beginning with lymph from a buffalo calf it was passed

through a cow calf to bring it up to strength and then continued in series through buffalo calves —



This concludes the experiments performed during the past year. It remains only to sum up this and the previous year's results. I do this in the form of a table of comparison between glycerinated and vaselinated lymphs.

Tabular comparison of Glycerinated and Vaselinated Lymphs

Summary

GLYCERINATED LYMPH

- 1 Prolonged contact with glycerine results in destruction of vaccine virus, but means can be taken to minimise this action by regulation of temperature.
- 2 Contains when ready for issue few or no extraneous micro organisms and those which are present are restrained from multiplying.
- 3 Gives uniform results owing to thorough admixture.
- 4 Can be subjected to the chloroform process, and so become available for use at any period after preparation.
- 5 Little or no liability to produce inflammation (so-called "strong lymph").
- 6 Duration of activity at a low temperature not less than three months in the case of a good quality lymph.
- 7 Liability to deteriorate from the effect of heat, less than "pure" undiluted lymph.

VASELINATED LYMPH

If lymph contained no extraneous organisms, prolonged contact with vaseline might be presumed to be without danger of destruction to the vaccine virus when kept at a low temperature.

Contains innumerable extraneous organisms when issued, and these are in no way restrained from multiplying.

Liable to give unequal results owing to difficulty of admixture.

Cannot be subjected to the chloroform process.

Liable to give rise to inflammation and ulceration.

No superiority in duration of activity.

Liability to deteriorate from the effect of heat less than "pure" undiluted lymph but greater than glycerinated lymph.

* These numerals indicate successive passages. By the 3rd or 4th passage in buffaloes—the lymph failed to produce a proper eruption. On a cow calf it only gave a fair result, but with an extra passage gave an excellent result. In the case of children it was still capable of giving very good results. This would seem to indicate—and this also corresponds with my experience—that the order of susceptibility from maximum to minimum would be child—cow calf—buffalo calf.

Recommendations

I would recommend—

- (1) That glycerinated lymph should be substituted for vaselinated lymph in the Punjab
- (2) That the glycerinated lymph should first be treated with chloroform
- (3) That a central lymph depot should be established in Lahore from which lymph could be supplied to the districts of the Punjab
- (4) That all vaccinators should undergo a course of training at the Central Depot

THE NATURE AND PROPHYLAXIS OF THE FEVERS IN THE DINAJPUR DISTRICT

BY LEONARD ROGERS, M.D., M.R.C.P., F.R.O.S.,
CAPT., I.M.S.

I.—THE VARIETIES OF FEVER MET WITH

It has already been mentioned in the first part of this report* that the enquiry was carried out in the minimal fever season, and that the village enquiry occupied the major part of my time. Nevertheless, a few cases of fever were met with attending the Dinajpur dispensary, the blood of which was examined for malarial parasites, while on two occasions a number of chronic fevers in the most feverish part of the district were examined by means of spleen puncture for the recently described parasite like bodies found last year in chronic fevers by Leishman and Donovan, and more recently in a case from Sylhet by Manson and Low.

TABLE VII.—CHRONIC MALARIAL FEVERS

No	Sex	Age	Duration of fever	Recent fever	Anæmia	Darkening of the skin	Enlargement of the spleen	Liver edge below ribs	Wasting	Malarial parasites
1	M	7	3 years	Slight	Slight	Very dark	Beyond navel	Nil	Thin	Mal. tert
2	"	7	2 "	Frequently	Do	Extremely dark	A S S	1"	Do	Do
3	"	12	2½ "	Every day	Marked	Dark	To navel	Do	Do	Do
4	"	14	2 "	Do	Do	Nil	Beyond navel	Nil	Nil	Do
5	"	8	3½ "	Frequently	Very marked	Dark	A S S	1"	Thin	Crescents

A S S equals down to the anterior superior spine of the ilium

Firstly, with regard to the kinds of malaria met with, the commonest variety was the malignant tertian form just as it is in Calcutta, and most parts of India. One case of benign tertian was also found in Dinajpur. During the village enquiry a history of quartan fever was obtained in a number of cases in the circle, a few miles to the east of the town, and these cases were usually of a chronic nature, terminating fatally after several months of fever. During my last visit to Ransankail, a patient came to the hospital with a history of fever of the quartan type, and having suffered from an attack two days before. An examination of his blood showed typical quartan parasites, some just beginning to sporulate, which would correspond with his statement. These cases are probably much more common in the rainy season, and are of interest in connection with the finding of *A. Listoni* in the district to be mentioned presently, for in the Duars the Malarial Commission found quartan fever to be the commonest type, and to be also associated with the same species of anophiles. All three varieties of malaria were thus met within the district even in the dry season, but it is not possible to deduce accurately the relative prevalence of each from the few cases found at this time of the year.

A more important question to solve was whether the Leishman-Donovan bodies could be found in chronic fevers in this district, and, if so, the frequency, of their prevalence and how to differentiate from ordinary chronic malaria. Dinajpur was an especially interest

ing place in which to examine this question, for as I showed in my report on *Kala-azar*, that epidemic took its origin in a very severe outbreak of fever in the Dinajpur and Rangpur districts in the early seventies, owing to a succession of very unhealthy years, on account of deficient rainfall. The brief description as yet published by Donovan pointed to a close resemblance between his cases and *Kala-azar*, and he has recently suggested that they may be the same disease. For purposes of searching for this new parasite, it is necessary to do a spleen puncture, as they have not yet been found in the peripheral circulation. This little operation is without danger if properly done, but it necessitates being able to examine the cases in a hospital and careful antiseptic precautions. For over a month a careful watch was kept for suitable cases in the Dinajpur in-door dispensary, but no such case presented itself. On discussing the question with Captain Megaw, I.M.S. (to whom I am very greatly indebted for much help throughout my investigation, both in getting me cases and in helping in the microscopical examination of some of the slides) he informed me that he had seen a number of such cases at one place only, and that was Ransankail in the north west part of the district. When at this place on the village enquiry a number of such cases were met with in the villages around, and they came to the dispensary, which was the most popular one in the district, and by means of anaesthetising the surface of the skin with anethyl chloride spray, spleen puncture was readily performed, even in children, in a painless manner and without the slightest difficulty on the part of the patients, except in so far that some

without fever were disappointed at not being submitted to the new treatment. On a subsequent occasion, a second series was done at the same dispensary, every case with any considerable enlargement of the spleen and recent fever being taken without any selection, the histories of the cases being also carefully recorded. These cases taken as a whole were exactly those which have always been considered to be "Malarial Cachexia," some of them presenting as great enlargement of the spleen and liver, accompanied by general wasting and darkening of the skin, as is seen in typical cases of *Kala-azar* or *Kala-dukh* when they were considered individually. Others of the cases only presented comparatively slight enlargement of the spleen, such as in variably results from repeated attacks of malarial fever. Including one case examined later in the Dinajpur hospital, 30 in all were submitted to spleen puncture, and in most of them a slide was also made from the peripheral blood, and examine for malarial parasites, and a differential leucocyte count made. In this way, it was expected that it would be possible to get some clear ideas as to the differentiation of the class of cases in which the new parasites were found from the malarial cases. The results obtained can best be shown by tabulating them in groups.

It will be seen that these cases were of a very chronic type of fever, and all showed the malignant tertian variety of malarial parasite and marked splenic enlargement. Nos 2 and 4 also showed marked increase of the large mononuclear white corpuscles, namely, 14 and, 7 per cent, respectively. No 3 showed 2 per cent, and No. 5 only 6 per cent.

* Part II only of this valuable report is published here.—
ED., I.M.G.

TABLE VIII.—CHRONIC FEVERS SHOWING LEISHMAN DONOVAN BODIES

No	Sex	Age	Duration of fever	Present fever	Anæmia	Darkening of the skin	Enlargement of the spleen	Liver below ribs	Wasting	Leishman Donovan bodies
1	F	4	15 months	Daily	Very marked	Dark	A S S	1"	Extreme	Numerous
2	M	15	1 year	Do	Marked	Very dark	Beyond navel	1"	Do	Scanty
3	"	25	2 years	Slight	Slight	Dark	4"	Nil	Slight	Numerous
4	"	15	7 months	Daily	Do	Do	Beyond navel	Do	Extreme	Scanty
5	"	40*	2 years	Do	Do	Nil	4"	Do	Thin	Numerous
6	"	14	1 month	Do	Do	Do	To navel	1"	Nil	Scanty
7	"	8	1 year	Do	Very marked	Do	Do	Nil	Extreme	Do
8	F	7	1 month	Do	Marked	Dark	Beyond navel	1"	Thin	Numerous
9	"	6	1 year	Do	Slight	Nil	A S S	4"	Extreme	Scanty
10	M	8	1 "	Nil	Marked	Dark	Do	1"	Do	Do

Died of pneumonia. Bodies found in spleen, liver and bone marrow *post mortem*.

The above table shows a very similar class of cases to those in that of the malarial series, and also a very great variation in the duration of the disease. Thus in cases 6 and 8, the fever had only lasted one month, and no marked cachexia was present, although the spleen in both cases was very large for such a duration of fever being down to the navel. In No. 8 the temperature was 100.2 at the time the spleen puncture was performed, and the slides contained the largest number of bodies met with in any case in the Dinajpur district. In both series of cases darkening of the skin was a marked feature of the majority, and in some instances the patients or their relatives volunteered the statement that the skin had become darker recently. In nearly all of both series there was distinct and often extreme wasting, the face and limbs being very thin, and contrasting with the large abdomen presented the typical picture of the condition always known as "malarial cachexia," but this remark is equally applicable to those which showed only malarial parasites as to those which presented the new bodies recently described. In short, these examinations throw no light on the very difficult question of the differentiation of the malarial cases from those which are presumably due to the new bodies, admitting for the present that they are parasites, as they appear to be. It is of course possible that all these chronic cases may be due to the new bodies, and the presence of malarial parasites in some of them was an accidental complication. It appears to be more likely, however, that the new bodies are a form of protozoa very closely allied to the malarial parasites, and producing a, very similar train of symptoms, but with a greater tendency to produce rapid cachexial state, and with a greater resistance to the action of quinine in ordinary doses. In view of the above results, it is clear that the differentiation of the two forms by purely clinical means apart from spleen puncture will be a matter of extreme difficulty, and will require a study of a much larger series of cases than the present one. The fact that one third of these cases showed the new parasite is sufficient to prove that it is present in a large proportion of these chronic fevers. On the other hand, in no less than half the cases, neither malarial parasites nor the new bodies could be found even by spleen puncture, although all but two of the patients gave a history of fever continuing for a long time up to the date of examination, and chiefly occurring at night, or, in the evening. It is clear, then, that no more can be said than that the new parasite-like bodies can be found by spleen puncture in a number of chronic fever cases, with large spleen in the Dinajpur district, and that no distinction can at present be made out between the symptoms seen in these cases, and in

those due to repeated attacks of malaria, in which malignant tertian parasites were found†

With regard to the nature of the bodies found in the former cases, there is little to be said, for in view of the fact that such authorities as Laveran, Ross and Manson are at complete variance as to the classification of them, it is useless to add one more to the opinions already expressed with regard to their nature. I will only say that nothing like a trypanosome was ever seen in any of the cases, either in the peripheral blood, or in that drawn direct from the spleen during life. I hope to be able to submit coloured drawings and specimens to high English authorities on protozoa very shortly, in the hope that they will be able to throw some light on the question, but in all probability some of the stages of the parasite have still to be discovered†. The form most frequently seen is a small oval body slightly longer than it is broad, measuring about one-third the diameter of a red blood corpuscle in its longest axis. It has two nuclei, one of which is small and often rod shaped and stains deeply, while the other is rounded, considerably larger, but more feebly stained. They are free in the blood from the spleen and in most of the cases are scantily met with, but in exceptional instances, and usually in cases which showed an actual fever at the time the blood was taken, they may be very numerous, a number of them being seen in some fields. In addition to this common form, small groups of similar bodies are met with clumped together, so as to very closely resemble a quartan sporulating body, some of them being in the act of breaking up. A still earlier stage is sometimes seen in which pairs of unequal sized nuclei are grouped within a single cell, but no separation into the small bodies is yet to be distinguished. These last bodies are somewhat larger than the largest of the simple forms, and appear to be formed by a subdivision of the nuclei of largest of the full grown small forms. I have not been able to detect these bodies in the peripheral circulation by examination of ordinary blood films, but this would not exclude the possibility of their being present in small numbers there. They may be found within the polynuclear white corpuscles, and be thus undergoing degeneration, which is of interest in connection with the very great reduction of the total leucocytes, and especially of the polynuclears in these chronic fevers which I have previously pointed out.

KALA DUKH AND KALA AZAR

In accordance with my instructions to visit the Kala-dukha area of Purnea district, I made enquiries from the district authorities as to the parts at present affected by the disease, and was informed by the Civil Sur-

* Since my return to Calcutta, I have been able to find these parasites in still larger proportion of this class of cases, nearly every case of so called "Malarial Cachexia" having shown the new parasites in the spleen, while they could not be found after death from other diseases.

† Since the above was written the author himself has shown that the Leishman Donovan bodies are stages in the development of a trypanosome, *L. M. G.*, October p. 336—*Ed. L. M. G.*

geon, Captain Hayward, says that it was to be found in the north of the Kissenganj subdivision. I wrote to the Subdivisional Officer for information some three weeks before I intended to start for the Purnea district, but did not receive any reply until after my return from a fruitless search for the disease, and then was informed that it had died out of the district. During my visit to the area under the kind guidance of Captain Hayward, evidence was obtained of the spread of the disease in a northerly direction, for at Aloobaree it had been present eight years ago, while eight miles further north at Chapra it has disappeared only three years ago. On reaching Thaurganj, 16 miles north west of the first named place, search was made for cases in the neighbouring villages, which were badly affected by the disease at the time of the enquiry made by Major Harold Brown in 1898, but here we were informed that it had disappeared a year ago, and two persons who had suffered from the disease were shown me, one of which had been free from fever for a year and appeared to be nearly completely recovered from its effects, while the other had had no fever for six months, but was still thin, and his spleen reached nearly to the navel. No cases still suffering from fever could be found, so no spleen punctures could be performed with any hope of finding the new parasite like bodies.

On the other hand thanks to the kindness of Dr. Dodds Price of the Nowgong district of Assam (who helped me so materially in my enquiry into the nature of Kala azar in 1896-97) in very kindly sending me slides made from blood obtained by spleen puncture in seven cases of Kala azar, I was able to search for the new parasites in these cases. The results are shown in the following table, one slide was spoilt in trying a new fixing agent—

TABLE IX. KALA AZAR CASES.*

No	Duration of disease	Parasites
1	7 months	Numerous
2	3 years	Ditto
3	2 " improving	Nil
4	5 months	Numerous
5	8 "	scanty
6	2½ years	Do

It will be seen from this table that the new bodies were found in every case except one, which was improving, and in which recovery was expected to take place. They were more frequently present in large numbers in this series than in the Dinajpur cases, but no differences in the appearances they presented could be made out in the two series. Since these observations were made a paper by Dr. Bentley, of Assam, has appeared announcing that he has also independently found the Leishman Donovan bodies in Kala azar cases, and abandoning the theory he advanced a little over a year ago that Kala azar was a severe form of Malta fever.

The importance of these observations lies in the fact which I pointed out several years ago, that single cases of the Assam epidemic disease were indistinguishable from cases of ordinary "Malarial Cachexia," so that the discovery that a protozoal parasite (differing from that of malaria and producing the same condition as repeated attacks of malarial causes), is to be found in many cases of "Malarial Cachexia," and in the communicable form of the disease in Assam will fit in with the known facts. So far the new form of parasite has not been found to contain pigment, so that if this is confirmed, then it will be certain that in both the endemic and the epidemic form of the new fever, malaria must be a nearly universal complication, for I showed both in Assam in the case of Kala azar, and in Calcutta in the case of "Malarial Cachexia," that melanotic pigment characteristic of malaria is, in my experience, always to be found in the organs *post mortem* in both

series of cases. Possibly it may prove that the new parasites are a secondary infection in patients already infected with malaria, which is so well nigh universal in both Eastern Bengal and Assam, but such points can only be cleared up by further investigations. From the practical point of view, the most important inference lies in remembering that quinine in large doses is the only drug which will cure these chronic fevers, although it undoubtedly not infrequently fails in neglected cases. Further, as demonstrated by Dr. Dodds Price, of Nowgong, the drug is undoubtedly an efficient prophylactic against the disease, for while carrying out the segregation measures I recommended (which proved eminently successful in getting rid of the infection of coolies' lines), he found that his hospital assistants and menials in the Kala-azar camp one after the other contracted and died of the disease. He then took to dosing them regularly with quinine, after which, in the course of several years, he only lost one man, who had become infected before the quinine administration. If it is such a powerful prophylactic, it can hardly fail to have curative effects in big doses in early cases of the disease, so that the measures which will be of value in preventing this class of fevers will be the wide distribution of quinine, as in malarial fevers.

VARIETIES AND DISTRIBUTION OF ANOPHELES

The facts collected bearing on the presence of malarial bearing mosquitoes in different parts of the district may next be dealt with. A careful study of this part of the question was first made in Dinajpur town, and subsequently the varieties found in different circles in the district were worked out. As Stephens, Christophers and James have shown that the varieties of anophelids present in any district play a very important part in the etiology of malaria, it is necessary to ascertain the proportion of the different kinds as well as the total number of the anophelids present. Thanks to the recently published book of the two first named authors, this is not such a difficult task as it was a short time back. In searching for anophelids, it is necessary to ascertain both their breeding places and also the numbers actually met with in the houses of the people. The latter was done with the aid of the Municipal Overseer, who rendered great assistance in the matter. In the month of January, when this survey was carried out, the breeding places were limited to the rivers which run past and through the town, and the tanks within it, which are not very many in number. The former include a very sluggish weed overgrown stream and a canal of a similar nature which run through the eastern part of the municipal area, while it is bounded on the west side by the river. There are several good brick lined drains in the town, but most of the roads still have only earth surface ones, which always retain water, and form the most important breeding ground for anophelids in the rainy seasons, so that the distribution of the different varieties will be very much more widespread at that time than they were at the time of my inquiry.

In all no less than five varieties of anophelids mosquitoes were actually caught in the houses. That which was by far the most commonly met was *A. Fuliginosus* as will be seen from the table below. Next came *A. Rossii*, although this variety was only present in large numbers in the houses near the tanks in the centre of the town. The next most frequently met with was *A. Listoni*, and this is probably the most important of all, for the Malaria Commission found it to be associated with a very high prevalence of malaria in the Duars, where it was the most common anophelid met with, and the only one which they found to be naturally infected. It has not hitherto been found south of the Jalpaiguri district as far as I know, so its presence throughout all the most malarious parts of Dinajpur is noteworthy for although only found in small numbers during my visit from January to March, yet there are good reasons for believing that it may be present in

* This observation has since been confirmed in two further series of slides from Kala azar cases.

much larger numbers in the rainy fever season. In the first place, this variety breeds exclusively in running water, so that its breeding places in the cold dry season are limited to the streams on either side of the town. In the rainy season, however, there will be numerous flowing streams and earth lined drains which will afford it adequate breeding grounds throughout the town. Once more in the Punjab, Major Adie has shown that, although in the dry season *A. Fuliginosus* is the common anopheles met with, yet in the rainy fever season, it is nearly entirely replaced by the *A. Culicifacies*, which belongs to the same group of small dark malaria carrying mosquitoes as does the *A. Listoni* met with in Dinajpur. It is probable, then, that this dangerous variety is much more common in the fever than it is in the dry season. The other two varieties met with in the houses are of much less importance, for they belong to the wild group which breed in swampy places and rarely enter inhabited houses, while they have never yet been found to be carrying malaria under natural conditions. These are the *A. Barbirostris* and *A. Sinensis*, the latter having only once been found in the houses, although their larvae were met with not very rarely in weed-grown streams and canals, especially to the east of Dinajpur.

With regard to the breeding places of these varieties, it may be said that *A. Fuliginosus* was met with in both the streams and also in weed grown tanks. *A. Rossii* in the tanks most commonly, *A. Listoni* chiefly in the sandy river to the west of the town, especially close to the grassy banks, but they must also have been breeding in the more sluggish streams to the east, as they were caught in the houses of that part of the town. The other two were found in the weedy streams as already mentioned. While making collections in the houses in different parts of the town, striking differences in the local distribution were met with. Thus, while *A. Rossii* abounded in the central tank strewn portion, and *A. Fuliginosus* and *A. Listoni* near the streams on either side of the town, there was a dry zone between the central and the western portions in which a very careful search failed to reveal a single anophele. Moreover, the more intelligent inhabitants of the riverine portion, where most *A. Listoni* were found, were convinced that this was the most malarious portion of the town in the rainy season, although this was not evident at the time of my visit in the dry healthy season.

Turning next to the distribution of the anopheles in the district circles, which is illustrated in Table X, we find the *A. Fuliginosus* to have been the common variety in all parts of the district in the cold season. *A. Rossii* and *A. Sinensis* were seldom found except in the town of Dinajpur, and *A. Barbirostris* was only occasionally met with. With regard to the malarial-carrying *A. Listoni*, it is worthy of note that it was not met with in Porsa at the extreme south of the district, this being also the least feverish part, nor could its larvae be found in the river, which appeared to present favourable conditions for its presence. In Churaman also, which is also comparatively little feverish, I failed to find this variety. It would not be wise to lay too much stress on this point as the distribution of this mosquito might be much more extensive in the malarial season.

TABLE X—VARIETIES OF ANOPHELES FOUND IN THE HOUSES.

	Dinajpur	Balighat	Porsa	Churaman	Ranikankul	Total
<i>A. Fuliginosus</i>	178	51	103	108	108	546
<i>A. Rossii</i>	39	5				44
<i>A. Listoni</i>	6	4			6	16
<i>A. Barbirostris</i>	3	1		1	3	8
<i>A. Sinensis</i>	2					2
Total	228	61	103	107	117	616

Dissection of Anopheles—In addition to ascertaining the varieties of anopheles present in the houses, it is also necessary to find out by means of dissections and microscopical examinations of the salivary glands for sporozoites, which varieties are actually carrying infection. For this purpose 138 anopheles cut in the houses in Dinajpur were examined for sporozoites, but none were found. Nearly all of them were *A. Fuliginosus*, which was never found to be naturally infected by the Malarial Commission, although they showed that it can be artificially infected. More recently Major Adie in the Punjab found one of these anopheles to contain sporozoites resembling those of human malaria, but it is clear that it is not a common carrier of the disease. Unfortunately very few, *A. Listoni* could be obtained for dissection, and no sporozoites were found in them. This is not surprising, for these dissections were carried out in the cold month of January, and it is well known that a certain temperature is necessary to allow of the development of the malarial parasite in mosquitoes. In a previous paper, I showed that the number of cases of malarial fever fell off very rapidly in a suburb of Calcutta as soon as the minimum temperature fell to 80°F, doubtless for the reason just mentioned, and as the minimum temperature in Dinajpur in January was much below that point, it is not surprising that no sporozoites could be found. I had hoped to be able to ascertain if the *A. Listoni* was infected when the weather had become warmer again, and just before leaving Dinajpur in the middle of March, I tried to collect the necessary mosquitoes, but they were still as scanty as earlier in the year, so I was not able to obtain them in sufficient numbers for dissection. This point can only be settled in the rainy season, but as Dinajpur is close to Jalpaiguri, where the Malaria Commission found the *A. Listoni* to be infected later in the year than the time of my inquiry, there can be little doubt that this is the variety which is mainly responsible for the prevalence of malaria in Dinajpur and the neighbouring districts, for I also found this species in small numbers in the north west corner of the Purnea district.

THE POSSIBILITY OF DESTROYING ANOPHELES IN LOWER BENGAL

It will be convenient in this place to discuss the practicability of attempting in Lower Bengal to destroy those anopheles which carry the infection of malaria as a method of malarial prophylaxis. It will be clear from what has been written above that it would be an utter waste of money and labour to attempt to destroy all the different kinds of anopheles, when only one, or possibly two of them, have been found to carry the disease in nature. Thus it is now generally admitted from dissections of many hundred *A. Rossii* that these are never found to be naturally infected, although they can be infected by artificial means, and are thus theoretically capable of conveying the disease. For the same reason, we may exclude from our consideration the swamp species which very rarely enter houses, and have also not been yet found to be naturally infected. This leaves us with only the *A. Fuliginosus* and *A. Listoni*, the former of which has only once been found naturally infected in the Punjab, while there it almost disappears before the fever season begins. If it proves to have a similar seasonal distribution in Bengal, it may also be excluded from consideration as not being of any material importance in the etiology of malaria. Some three years ago, a plan for destroying anophele mosquitoes in Calcutta was initiated under the idea that they only bred in small pools, which could be easily dealt with, as suggested by Major Ross. At that time I made a careful search for the breeding places of anopheles month by month for more than a year in a selected area in a suburb of Calcutta, with the result that I found them to be breeding in enormous numbers in nearly all the tanks during the hot weather months, that is at the time

of the minimal malarial season. On the other hand, they were much fewer in number during the rainy malarious time, but their distribution was then different the tanks being free from them, while the chief breeding places were small pools and more especially the shallow uneven earth drains on each side of every road. Moreover, in these roadside drains varieties of anopheles which can carry malaria were found, whereas those which had swarmed in the tanks at an earlier period were all *A. Rossi*, which we now know (8) are harmless, as far as the spreading of malaria is concerned. The measures which were being taken for destroying the *A. Rossi* in the small pools and tanks, then, were only money thrown away as far as malarial prophylaxis was concerned. This example is mentioned to show that great circumspection is required in recommending measures for destroying anopheles in Lower Bengal.

A still more instructive example is that of the measures which have been carried out under the directions of members of the Malaria Commission during the last two years at great expense, to test the practicability of destroying anopheles in a portion of the very malarious cantonment of Mian Mir (10), the results of which have recently appeared. In this place, the chief breeding ground of the malaria bearing variety was the irrigation canals which traverse the cantonment. The results of these operations will be familiar to the Sanitary authorities, but briefly it may be said that the elaborate measures carried out persistently for two years resulted in only a slight diminution of the number of anopheles in the houses of the treated area. On the other hand, much good was obtained by prophylactic issue of quinine, and still more marked effects were got by treating all the children in a syce line in this way, malaria being nearly absent from both the children and the adults. Further, the moving of some syces from their old lines near the canals to one-half a mile or more from them resulted in an entire absence of both the anopheles and of malaria fever among them. That the total destruction of the malaria bearing mosquitoes will prevent the fever is certain, but experience in India has proved that it is only in very exceptionally favourable conditions that this measure is practical, while it must be continued indefinitely. Such conditions were met with at Ismailia, where rain falls on but very few days of the year, and certain swamps and pools were easily permanently filled up. Here the resulting reduction of malaria has been most marked, but to attempt to apply this method to the totally different conditions of Lower Bengal and to expect similar results would be utter folly.

In view of the above facts, let us return to the conditions met with at Dinajpur. Here we have the malaria-bearing *A. Listoni* breeding throughout the course of two streams, one on either side of the town, and probably also in the rainy season in the numerous subsidiary streams which flow into the main one during that time. To attempt to destroy the larvae in these rivers throughout the rainy season is obviously utterly impracticable. Something may be done by steadily extending year by year the brick lined drains through the main streets, so as to do away with the stagnant earth lined drains, the bottoms of which it is almost impossible to keep sufficiently level to prevent water standing in them. Further within the municipal limits the formation of borrow pits during road-making by the Public Works Department should not be allowed, as at present, for they form excellent breeding grounds in the rainy season. These measures are only applicable to the town itself, and do not touch even the smallest proportion of the total population of the district, among whom it is quite impracticable to attempt to destroy the malaria bearing anopheles. It is quite clear, then, that some other measure than mosquito destruction must be relied on.

THE VILLAGE DISTRIBUTION OF QUININE.

Where it is found impossible to destroy the intermediate host of the malarial parasite, namely, the malaria

carrying varieties of anopheles, the only other practical method of malaria prophylaxis is the destruction of the parasites during their cycle in the human subject. This can only be done by efficient doses of quinine, so that the problem resolved itself into one of devising a practical scheme of village distribution of quinine. It has already been mentioned that the administration of quinine regularly as a prophylactic to the children of a syce lines in Mian Mir not only saved nearly the whole of them from malaria, but was also effective in preventing the infection of any of the adults in the same lines, although these latter took no quinine whatever, because adults are infected by mosquitoes, which have first derived the infection from children as a rule. I have also shown in an earlier part of this report that the main death rate from acute malaria is among children during the few months of the rainy season, and immediately afterwards. If these could be adequately treated with quinine as soon as they developed fever (for its prophylactic distribution to children in villages is as yet beyond the region of practical policy), not only would the main source of death rate from malaria be stopped, but at the same time there would be much less infection among adults, and fewer deaths from chronic malaria and from other diseases such as pneumonia, dysentery and phthisis, which so often attack those debilitated by previous malaria.

In discussing this important question we must first consider how far the present agencies for the distribution of quinine meet the necessities of the case. They are the dispensaries, private practitioners and the post offices. That the dispensaries effect great good by the treatment of fevers with quinine was abundantly evident throughout my inquiry, for in every place where there was a flourishing dispensary the spleen-rate was considerably lower than it was in the neighbouring villages, the differences being much greater than could be accounted for by the position of the dispensary on a slightly higher and more healthy site in some instances. The difference was most marked among the children of the more intelligent classes, for it was particularly marked among the children attending the larger schools. The most striking example met with was that of a school at Churaman which stood next to the dispensaries, for among 31 children only two had any enlargement of the organ, or 6 per cent, by far the lowest rate met with in the district. In this instance I ascertained from both the School Master and the Hospital Assistant that the boys were regularly sent to the dispensary from the school when they were found to be getting fever. In Balughata a very similar state of affairs was found. As it was not uncommon for about one third of the children attending the school to be down with fever at one time in the rainy season, it is clear that they must most of them have been treated during the year. The Civil Surgeon, Captain Megaw, R.M.S., had been struck by this fact before my arrival in the district, and my own experience amply confirms his. The range of such a dispensary unfortunately is seldom more than two or three miles, or five at the outside, so that the quinine distribution of seven dispensaries among the one and-a-half million persons in the district of Dinajpur is scarcely more than a grain in an extensive sandy desert, and any practical increase can only be a matter of very slow growth. Private practitioners abound in Dinajpur itself, and although a large proportion of them profess homoeopathy, yet they doubtless do some good in the treatment of fevers. In the district itself, however, they are almost a negligible quantity.

Turning next to the post office distribution, I found that there are but 40 post offices to very nearly 4,000 square miles, or one to every 100 square miles. Further seven of these are in the same places as a dispensary is situated. During 1903, throughout the whole district only 8,064 packets of the drug were sold among 1,500,000 people, although my enquiries showed that the great majority of the population suffer from fever repeatedly in each year. These figures will suffice to bring home

the fact that the infinite majority of the population of Dinajpur, and doubtless of all other malarious districts of Bengal, are beyond the reach of the one drug, which will save their lives when attacked by malaria, to say nothing of an infinite amount of suffering and loss while thousands of children die yearly, whose lives could be saved with absolute certainty if quinine were readily available for their treatment.

My object in laying stress on this fact, which is only too well known, is because my enquiries have led me to believe that something can and ought to be done to remedy this cruel loss of life from malaria, specially among children. Some of the dispensaries do not do all they might, the stock of quinine supplied being often utterly inadequate, while it is occasionally allowed to run perilously low, with the result that it is not dispensed when it should be, as in one case only six drachme were in hand at the time of my visit, but this is a matter for administrative care. Perhaps more quinine would be used if the good an outdoor dispensary does was measured by the amount of quinine dispensed rather than by the number of petty operations performed, but still any improvement thus effected would only touch the fringe of the question. What is really wanted is some system of distribution of the drug in every village. I have discussed with the district postal authorities the possibility of a more extended distribution of the drug through the postal peons on their visits to the villages, and I am of the opinion that something might be done in this direction by giving a small commission to these agents in order to stimulate the sale of the pice packets. Still it appears that many small villages and hamlets may not be visited for weeks at a time by the postman, especially during the rainy fever season when communication is at its worst, and some new agency actually residing in the villages themselves is necessary if any real success is to be obtained. Such an agent should be somewhat more intelligent than the village chaukidar whose burden is already quite as much as he can bear, and should also, if possible, be in close touch with the children, whom it is particularly desired to reach. Such a man is the village school master for a primary school is now to be found in nearly every village or group of villages, and it would be to the advantage of the master to get his pupils to take quinine whenever they get fever, for he is interested in keeping up the figures of his attendance roll, which is greatly affected by absence on account of malarial fever in the rains. I am informed that the masters of the primary schools get only about Rs 10 a month, so they would not be above accepting a small commission on their sales, which would encourage them to do their best in the matter. The headman of the village might in some cases also be enlisted among the dispensers of quinine. I have spoken to many intelligent natives, both official and unofficial about this plan, and they have all approved of its being given a trial. Whether it would be advisable to supply packets free to the schools or to sell them below cost price at first in the most malarious tracts is rather difficult to decide, as it might lead to purchase for the

sake of selling again at a higher price, while difficulties might arise when the drug had become sufficiently popularised to make it advisable to raise the price to its cost point. I think, however, some packets might be supplied free to the schools. This is a matter for the sanitary and administrative authorities to settle, but that some system of village distribution of quinine among the children more especially, is an urgent necessity if the heavy death rate from malarial and chronic cachexial fevers is to be lessened, is quite certain, for it is the only practical method of prophylaxis in the swampy mosquito swarming tracts of Lower Bengal.

AN OUTBREAK OF TRUE BERI-BERI AMONG THE STUDENTS AT TURA, GARO HILLS, ASSAM

By REV G O CROZIER, M D

BEGINNING in May of last year there has been a serious outbreak of beri-beri among the students here. If it is not this disease, I should be glad to have somebody put me right. The following record of cases gives most of the striking characteristics as the disease has appeared. Never having seen the disease before and the acute form appearing here being so different from the picture of the disease I had gotten from American text-books, the first two cases died before the disease was identified. I then took the third case over to the Civil Surgeon, Dr Banejee, just transferred from here, and he questioned if it might not possibly be beri-beri. From the available literature on the subject, English, American, and Indian, I became convinced that I was dealing with true beri-beri, and so at once sent the cases away from here on the recommendation of some authors familiar with the disease in India. It was concluded to be specially necessary to do so, as I had no suitable quarters for caring for such cases. All but three of those sent home have passed the acute critical stage and several have "recovered", but one died after two weeks marked improvement in his condition, whether from an acute relapse of a few days or from some other disease, I have not been able yet to learn.

I have been unable to come to an opinion as to probable or possible cause, or source of the disease. Some have said that at the south side of the district in a village from which some of the students came, there were several sudden deaths from the "same disease," and from the north are some other reports also unreliable. Certain, it is, that there was over-crowding in very dirty lines, but the second death was a case in an uncrowded, well-ventilated, and (for natives) fairly clean room in a line with board floor, bamboo walls and thatch roof, and the first death was from the same line but in a crowded room. This line is elevated on posts five feet from the ground on the crest of a hill. Other cases occurred among the students in this line, several in the other two lines with earth floor, and others in private houses on the hillside just back

¹ Donovan, *Indian Medical Gazette*, December 1903

² The differentiation of the continued and remittent fevers of the tropics by the blood changes. *Trans. of the Medical Chir. Soc.*, 1903, and *Lancet*, Volume I, 1903

³ Report on Kala dukh by Major Harold Brown, R M E, 1898 and in *Indian Medical Gazette* of 1898

⁴ Bentley on Epidemic Malta fever in Assam, *Indian Medical Gazette* September 1902

⁵ Is malarial cachexia purely malarial? *Indian Medical Gazette*, October 1902

⁶ Note on Kala azar by Dr J Dodds Price, *Indian Medical Gazette* October 1st, 1902

⁷ Kala azar successfully eradicated from tea gardens by segregation measures. *British Medical Journal*, September 1898, and *Trans. Medical Chir. Soc.*, 1899

⁸ Reports of the Malaria Commission of the Royal Society

⁹ Adie, *Indian Medical Gazette*, 1903

¹⁰ Report on anti malarial measures at Mirn Mir Scientific Memoirs, New Series, No 6, by S P James.

of the mission compound, and others among the girls in a large well-ventilated building with board floor, clean, and elevated from the dry ground. So I could fix upon no special locality as the source of the infection.

Neither has it been possible to see that any special food was the source of the trouble. The male students all board themselves generally in clubs of three to ten in their own private cook-houses. A group of these houses occupies a low valley on the compound and another group the hillside back of the compound. All eat practically the same sort of food—rice, dried fish and fresh vegetables, the common food of practically all Garos. But few eat *dhal*, though some are introducing it now in place of the fish. No single club was particularly affected. The second death was from a club of eight, a strong rugged young man of perhaps 24 years. He was a profuse smoker of the "smart," experimental sort, and I at first attributed his trouble (œdema of feet and legs, and acute dilatation of the heart) to tobacco poisoning, having had two tobacco hearts to deal with some time before in outside cases. The other cases have come from quite a number of the clubs.

Not has recovery given any clue to the matter, except that so long as they remained in their own quarters here they grew worse, but some speedily began to improve in their own home villages, while others have continued in a quite critical state for two months, though slight improvement is now reported by all but one. Two of the girls, Nos 7 and 9, together with their mother, No 8, were sent to Tura mount-top, 2,700 ft higher than the station, for three weeks with marked benefit. The boys went to their own homes in the southern and northern parts of the hills and the plains to the north. Some took native treatment, and some did not, and recovered so far as to be able to return to school here, continuing to improve since. On the day on which I examined systematically all the cases then known, a week after the death of the second case, eight control cases were also examined to be certain there was no special peculiarity among the people as a whole. Some of these were ill and some entirely well.

Following is in the main a copy or translation of the notes taken on the cases at the time they were examined.

1 *Control Cases*—Atalu, age 24, no symptoms, painful left varicocele for two months. Knee-jerk (k-j) above normal (+), Faradic irritation low on front of thigh and legs, normal elsewhere. Heart normal.

2 Sing, age 16, diarrhoea this morning, checked by medicine, no tingling sensations nor tired feeling in legs, heart normal, or slightly strong in action, faradic sensations normal, k-j +.

3 Pongon, 17, some headache, heart slightly rapid, faradic normal in all parts of legs and arms; k-j +.

4 Tamesai, 18, headache for a week, no trouble in legs or other part of body, faradic on front of feet and legs low reaction, heart normal, k-j normal.

5 Genen, 10, malaria daily for three days, electric reaction low over most of legs and thighs, but + over small area at upper-middle of right shin, k-j +.

6 Henry, 11, well, electric low over legs, less over shins than other parts, but not very different, k-j +, perhaps due to excitement.

1 *Beri-beri Cases*—Sandu, 24; male (as all are, not otherwise expressed). While I was away to the hill-top case developed what was considered bladder trouble and remained under native treatment to the last. I examined him partially a week before death. There were symptoms of stone but organs were painful, and I was not permitted to complete examination. Œdema of face and neck very marked, dyspnoea, urine very scanty. Was some tingling of feet and legs, also swelling. Patient died, June 10th, with extreme dyspnoea after an illness of a month.

2 Gopal, 23, came to me about June 1st, complaining of œdema of feet and difficulty at the heart. No abnormal condition discoverable with the urinary system, heart beat strong. Considered tobacco poisoning. Later case grew worse and in spite of strychnia, digitalis and alcoholics case died June 15th with extreme cyanosis, dyspnoea, and dilatation of heart to a finger-breadth to right of sternum, under third rib, to the left of left nipple. Urine during last few days greatly reduced, trace of albumin.

3 Mising, 20, 17th June. Tingling and œdema of legs, has lasted one week, headache little more than one week, all joints tired, but specially knees, flesh seemed hard, he says, not very perceptible lying down, sitting, standing and walking is worse, only legs and feet tingle, specially calves of legs, like "foot asleep." Yesterday gave dose of santaline and later castor oil, whole body tired, much reduced in strength. Is worse at night, says he is a little better to day. Daily treatment with faradic current over feet and legs, gave slight improvement for a time.

July 4th. While Gopal was sick had headache, tingling in legs began the day of his death. Then there was numbness, beginning in left calf, whole body tired as if he had done very hard work. After one week's illness first noticed œdema of legs, to-day legs largely swollen. Left leg was less responsive to faradic current, now no response to fairly strong current in either leg, thighs slightly responsive k-j +. Heart large, rapid, loud. Went home, July 5th, walking with great difficulty.

August 12th. Returned, walking 30 miles that day, next day examined. Calves of legs considerably swollen perhaps from the hard walk—"at home was normal", tingling sensation and numbness much improved, k-j slow. Heart

normal rate, sounds loud, nearly normal in size, possibly a little dilated still November 2nd, continuing to improve so far as can now be seen Took native medicine while home

4 Redin, 23, "began one or two days after Sandu's death" July 4th Legs unduly tired, heavy, back of legs and numb, thighs slightly swollen, not much pain on moderate pressing the calf No tingling Weak faradic, no sensation, no peculiarity of gait, though, says he, can't walk well No ankle clonus, k-j normal Heart nothing striking Went home, July 5th

August 12th Returned "well" 18th July k-j O Numbness and oedema gone, some numbness back of lower third of thigh, heart possibly enlarged, but nothing striking Legs not markedly heavy, but still not well, he says, is a little tingling November 2nd seems well

5 Tewari, 21 July 4th Began while Gopal was sick, complains mainly of lameness of knees and ankles, and tingling in legs, and inability to climb hills Not much tingling of fronts of thighs and legs, but is considerable of the backs and the top of the feet In walking there is a swollen sensation of the tops of the feet, muscles of calf of legs painful on pressure K-j O Heart enlarged both to right and left, sounds increased in intensity, regular and normal otherwise At present is said to be a little better at his home

6 Rejong, 22 July 4th Has some diarrhoea and dyspepsia, complains of heaviness of body, discomfort at the heart, and difficulty in breathing Electric reaction on tops of feet normal, but on balance of legs and thighs zero Heart normal A doubtful case Returned to school with case No 3, seeming to be entirely well

7 Romoni, 17, female July 2nd Had what seemed hysteria, recovered slowly and now (July 7) has been in school several days Was poorly one week before the attack During that week legs tired easily on walking No tingling then, during the attack was tingling in the legs and still continues, legs tire easily, "no other symptoms" There is slight anaesthesia of tops of feet, and some oedema of legs Heart sounds increased Symptoms practically all subsided during a two weeks' stay at the hill-top and visit to a neighbouring village At present symptoms returning

8 Dobaki, 30, the mation Very questionable case Two or three years previous to marriage was troubled with tingling in the legs and numbness All disappeared while living with husband and bearing four children Husband died some six years ago, for the last three years the former condition has been constant There is tingling, and irregular anaesthesia on feet, legs, thighs and finger-tips, is oedema of legs Heart action increased, not enlarged Two weeks on hill-top with marked improvement in subjective

sensations, tingling disappeared from thighs, now not easily tired on walking, no other change Now after two months, says, former condition gradually returning

9 Subonmoni, 19, female July 7th Tired feeling one week, this week tingling, some oedema and pasty hardness of calves, slight anaesthesia of tops of feet, heart labored, not enlarged Two weeks at hill-top, symptoms all improved, except numbness of top of feet Now apparently entirely well

10 Ain, 24 July 30th For a year has had trouble with his vision Ten days ago called at dispensary with indefinite complaint of eyes and assistant gave some stock eye medicine Next day I saw him and gave him santonine and something for his sluggish liver, not seen again till to-day Now k-j markedly +, dull sensations in both legs and feet; some tingling in calves, some oedema Heart markedly dilated both right and left, sounds all loud, slight left incompetence No aortic murmur, which was very marked clear to left shoulder in case 2 Urine decreased, high color, some peculiar sensation across lower abdomen Went home August 1st, said to be no change up to the present

11 Rangmin, 24 2nd Assistant in dispensary Been out of work four days, temperature 100° the last two days; eyes uncomfortable and vision poor No change after santonine, though some not included in this series, complaining of tingling were relieved by santonine and castor oil Has been tired for a month, legs heavy, and tire with but little walking, hands are weak, calves of legs hard and resisting but not putty-like, knees and calves very tired, heavy, tingling, painful on pressure, whole foot tingling Subjective sensations over whole body up to the neck dulled Sometimes dizzy, skin of abdomen has sensation as if drawn tight No change in appetite, bowels or urine K-j O Heart gives discomfort, even when patient is quiet, he is easily tired on slight exertion Two weeks ago a letter said there was slight improvement

12 Jengma, 24 August 6th Yesterday afternoon began to notice marked difficulty in breathing, and discomfort at heart Whole body tired, slight pain on pressure of calves, k-j normal or slightly Heart dilated to left nipple and under sternum, aortic sounds accentuated and some tricuspid incompetence August 8th K-j O, occasionally slight but much retarded, retarding in night more marked Tingling sensation began yesterday, no pain on pressure, numbness from knees down Is now at time of writing said to be well, though has not yet returned

13 Ajan, 24 August 8th Yesterday or the afternoon of the day before tingling began, and very tired sensation All normal on examination except hard pulse and exaggerated left heart sounds Returned from home in a

few weeks well, but for some time past troubled with dim vision and has returned home

14 Ataiam, 26 About August 10th Came in excitedly saying tingling sensations and discomfort in legs just began K-j reduced, heart slightly enlarged, and sounds accentuated Remained under observation a few days growing worse Returned from home in a month saying he was not entirely well, but much better

15 Goleiam, 18 August 15th Some difficulty in legs a month or two ago when so many were suffering with the disease, but got better Now for two or three days legs are heavy, tingling, some oedema, numb up to middle of thighs, but not wholly anæsthetic, k-j right +, left slow and— Heart sounds strong, not markedly enlarged August 22nd Symptoms and signs increased, and patient walks with difficulty Letter yesterday (November 1st) says possibly slight beginning of improvement

16 Jongim 22 August 17th Legs noticed this morning first First numbness, then later tingling, and now heavy, k-j + Has not noticed difficulty with the heart, but on examination apex beat is above and to left of nipple, dulness from right edge of sternum to left edge of areola of nipple and to 3rd costal cartilage Wavy pulsations over area of normal base September 29th Returned 25th, after absence of five weeks Heart seems normal, no tingling, slight numbness on calves, k-j +

17 Jangna, 16 August 22nd Specially noticed tingling in legs and weakness of heart on the 20th instant Heart distinctly dilated mainly to left, apex $1\frac{1}{2}$ inch below nipple and in nipple line Dulness to left sternal line, and a little higher than normal No pain on moderate pressure of calves, heaviness, but no apparent swelling, tension of muscles seems increased Returned after a few weeks at home apparently well

18 Rancheng, 22 August 30th Began Saturday 27th, felt a little poorly a few days before that, now tingling in legs, legs heavy and tired, arms also beginning a day later, gait stiff K-j 0 Says there is no trouble with the heart but it is enlarged to mid-sternum, upper edge of 3rd rib, and to nipple line Said now, November 2nd, to be little better but legs heavy

While there are some questionable cases among these, yet there are twelve of them that seem wholly unquestionable The suddenness of the attack in some was very striking, and the rapidity of the development and the great dilatation of the heart in some of the cases The gate was slow and heavy in most of the bad cases On striking the head of the tibia, there was a peculiar almost ringing sound as if striking a resonant piece of wood under water Poor vision seemed to accompany several of the cases, clearing up with the improvement of the case Several other cases with marked tingling in the legs and knees cleared up with a dose of santonine and castor oil

A Mirror of Hospital Practice.

TWO CASES OF DIPHTHERIA

BY D SIMPSON, M.D.,

MAJOR, I M S.,

General Hospital, Madras

THE following two cases of diphtheria admitted into the General Hospital, Madras, are of some interest in respect of the question of the existence or rarity of this disease in India. Mrs J, Eurasian, aged 49, wife of a tramway conductor, was admitted on the 25th August with high fever ranging from 103° to 105° F, rapid feeble pulse, and in a generally prostrate condition, complaining of bad sorethroat. On examination of the throat there was noted a grey, ashy appearance on the pillars of the fauces and tonsils and extending across the soft palate. Upon the following day, the pulse had become still more feeble, and the case, regarded purely from its clinical aspect, presented all the characters of diphtheria. There were also signs of impending cardiac failure pointing to the dangerous complication in diphtheria from the myocardium or cardiac nerves becoming affected. Besides using local applications, cardiac stimulants were therefore given, but the patient died of syncope on the 29th. Microscopic examination of a smear of the throat exudation was unsatisfactory, revealing little except the presence of numerous cocci, including streptococci, but there was a suspicion of the presence of one or two diphtheria bacilli in the field. Just before the patient died, several swabs were taken from the throat, and cultures made by Dr Chandia Sekhar of the Hygiene Laboratory. The microscopic examination of these left no doubt as to the nature of the disease, showing as they did the typical Klebs-Löffler bacillus.

The negative character of the microscopic examination in the first instance is significant, considering the intensity and marked character of the symptoms. This may possibly be due to the very late stage of the disease at which the smear was taken, but this more or less negative character of the immediate microscopic examination of a smear from the throat, is, I understand, by no means unusual in diphtheria. Moreover, conversely, persons may be going about with only a slight sorethroat or perhaps only soreness in the nostrils, and yet microscopic examination readily reveals the presence of the bacillus of diphtheria.

Striking examples of the latter condition were recorded in the *British Medical Journal* of February 14th, 1903, by Dr Sydney Davies, Medical Officer of Health for Woolwich, under the heading "Mild unsuspected Nasal Diphtheria."

as a link in the chain of infection " One of his cases was as follows —

"On September 17th, W W, aged 4, was taken with diphtheria, and moved to hospital on September 19th. On November 1st, M W, aged 13, sister of W W, commenced with the same disease, and on November 2nd and 3rd, respectively, E W, aged 6, and M W, aged 1½, brothers of W W. On visiting the house, I discovered a lad A W, aged 15, with a soreness and scab in the left nostril, throat normal. He was said to have a slight sorethroat for a week at the beginning of October, he had only stayed away from work for half a day. A swab was taken both from the throat and the left nostril, and the latter was found to contain diphtheria bacilli. There appeared little doubt that A W had been infected by W W, and had after four weeks, transmitted the infection to his remaining brothers and sisters."

The second case was that of an Eurasian child of ten years, admitted on the 29th September, complaining of severe pain in the throat and difficulty of swallowing and breathing. Her previous health had been generally good. For a few days previous to admission she had fever which was followed by pain and difficulty in swallowing notwithstanding the application of fomentations.

On examination of the throat, the fauces, tonsils and soft palate were seen to be covered with a grayish looking membrane, the tonsils having also a swollen and ulcerated appearance especially the right one. Urine had a sp. gr. of 1020, no albumen present. Temperature ranged from 102° to 104° F, but usually over 103°, and rarely falling to 102° F. The patient was in a very enfeebled condition and unable to raise her head, being as prostrate as if she had been suffering from a long, severe illness. A smear was taken from the throat, and bacilli found in abundance, which were examined by Major Donovan and pronounced to be the true Klebs-Loeffler bacillus.

In the matter of treatment, perchloride of mercury 1 in 500 was first applied to the throat in this instance, with some apparent local advantage, but without effecting the general symptoms. Therefore, after 24 hours, it was resolved to use antitoxin. 500 units were first injected with little apparent effect, except a drop of temperature to 102°, rising again, however, soon to 103.4° F. Next day, about 1 P.M., 2,000 units were injected at once, requiring four separate injections inasmuch as the preparation was only obtainable at the time made up in the minimum dose of 500 units.

There was, however, no local irritation at the sites of injection between the shoulder blades. On the following day, there was marked improvement of the general symptoms, the temperature having dropped to 99°, and also a noticeable improvement in the condition of the throat, which was less ashy in appearance, but as the latter had begun to show some slight improvement before, it is difficult to say whether this change was *propter* or only *post hoc*. However that may be, the general symptoms took

a very sudden and decided change for the better to an extent that would be difficult to otherwise account for than as due to the antitoxin treatment. The throat cleared up in a few days from the time of the second dose of antitoxin. There was great general weakness, however, for two weeks after the acute symptoms subsided, the child being unable to raise herself up in bed during that time. There was also some difficulty in speech and in swallowing for some days, not from any pain but from paralysis of the soft palate, otherwise there were no other paralytic sequelæ.

At one time it was thought diphtheria did not exist in India. Then it was thought to exist, but occurring only very rarely. It is possible, however, that it is less rare than has hitherto been regarded, the assumption of its rarity preventing the recognition of cases. But one feature of the disease so far has been that it has never shown any tendency to become epidemic in India, which is greatly at variance with its character in Europe. This feature, more than any other, is apt to put one off the track of the disease.

POISONING BY SULPHO-CYANIDE OF MERCURY

By CHUNJ LAL BOSE, M.B., F.C.S.,
Additional Chemical Examiner, Bengal

ONLY one case of poisoning by *sulpho-cyanide of mercury* in a human subject is on record. In this case which occurred in 1865, a "*Pharaoh's Serpent*" was swallowed by an adult male, who in consequence suffered from pain, dyspnoea, vomiting and rigors, but ultimately recovered. Blythe records an experiment in which 5 gram (about 7½ grains) of the poison administered to a pigeon, killed the bird in 40 hours "without convulsions." The bird was "indisposed," but no other symptoms were noted. So little is known of the action of the poison on human organism, that the following case which came under my observation in November 1904, is worth recording —

Tarangini, a sickly Hindu female child, aged 14 months, took a piece of the toy called "*Pharaoh's Serpent*" on the 7th November 1904, at 7 A.M., it was kept in a small basket with other fireworks on the previous night, which was the *Dewali* night. The contents of the basket were removed on the next morning, and some parched rice was given to the child in the same basket. Unfortunately, one piece of the toy remained in the basket undetected, and thus the child took with the parched rice. The child experienced a disagreeable taste, which found expression in her face and which attracted the attention of the attendant who put his finger into her mouth and brought out a small quantity of a yellow sulphur-like stuff, which was at once recognised to be a portion of the toy.

Shortly after, she began to vomit, attended with severe retching. The matter first brought up consisted of frothy mucus mixed with the pale yellow substance she had taken. She vomited several times within half an hour. She was then removed to a neighbouring dispensary where she was given two doses of sulphate of zinc (15 grain each) followed by warm water drink. This brought on copious vomiting. The vomited matter was of a yellowish colour mixed with much mucus. At about 8 A.M., the child was brought to me. She was weak and sleepy, apparently from exhaustion, otherwise, she was not bad. I advised small quantities of a mixture of milk and eggs to be given to her at frequent intervals, with 15 drops of brandy. The child brought up the first two doses of the egg mixture, but after that there was no more vomiting. The child remained sleepy and prostrated for about three hours, and then began gradually to recover. The bowels were not moved, and she made water for the first time at 3 P.M., after the ingestion of the poison, and then freely again at about 5-30 P.M. She had fever in the evening (temperature 101° F), which kept on during the night. There was no more vomiting and no purging. She slept well during the night and was found all right next morning. As in the case of poisoning by other salts of mercury, the symptoms were of an irritant nature.

"*Pharaoh's Serpent*" is a toy prepared by mixing a compound of mercury called "*sulpho-cyanide of mercury*" $\text{Hg}(\text{CNS})_2$ with gum and made into small cylinders. I examined one of the pieces brought to me by the father of the child, it was of a pale yellow colour (like sulphur), cylindrical in shape, $\frac{1}{4}$ inch in length, and about $\frac{1}{8}$ inch in thickness, it weighed 225 grammes ($3\frac{1}{2}$ grains).

I submitted the piece to chemical analysis, and detected *mercury* and *sulpho-cyanic acid* in it.

When burnt, it kindled and swelled up as usual to a bulky snake-like mass.

A CASE OF PERCHLORIDE OF MERCURY POISONING

By BAIJNATH VYAS, M.B.,

ASSISTANT-SURGEON,

Roorkee

THIS case is of interest and worthy of publication, especially at present time, when so much perchloride of mercury is used in plague disinfection, as it shows how easily an accident may occur either through ignorance or carelessness.

A former plague Naib Tehsildar, wishing to disinfect the clothes of his brother, who had exposed himself to plague infection, obtained some corrosive sublimate and made a solution for disinfecting clothes, in preparing the solution

a brass *lotah* was used, which, it is stated, was twice washed out with water after use. This *lotah* was afterwards filled with drinking water and, during the night, the brother drank from it, and after about five minutes complained of a burning sensation in the stomach, which soon became so severe that he rolled about in pain. I was called in, and saw him half an hour after, when his lower jaw and lips were swollen, breathing difficult, swallowing painful and saliva running from his mouth. He was treated with albumin, &c, but in a few hours swallowing became impossible, and he was fed *per rectum* for three following days, he apparently improved, when suppression of urine occurred, and he died on the fifth day from uræmic coma.

The only explanation I can give is that solution was not properly prepared and that some corrosive sublimate, in spite of washing out of the *lotah*, still remained in it in the form of a powder and, this subsequently becoming mixed with the drinking water, was the cause of the accident.

SERVICE NOTES

LIEUTENANT-COLONEL C. P. LUKIS, I.M.S., F.R.C.S., has recently taken his M.D. (London), and at the same time took the University Gold Medal in Pathology, a very creditable and indeed remarkable feat for a man of 25 years' service. We also understand that Colonel Lukis' son has recently won the £150 Entrance Scholarship at St. Bartholomew's—the same scholarship which Colonel Lukis himself carried off thirty years before. Bravo.

COLONEL R. MACRAE, I.M.S. (Bengal), has been appointed Inspector-General of Civil Hospitals in Burma, *vice* Colonel Little, retiring.

ON the departure of Major F. C. Clarkson, I.M.S., on furlough, Captain Clemesha, I.M.S., D.P.H., who has for some years past been a Deputy Sanitary Commissioner in Bengal, officiates as Sanitary Commissioner, Bengal.

COLONEL R. D. MURRAY, I.M.S., it is understood, will succeed Colonel Joubert as Inspector General of Civil Hospitals, in the United Provinces. Colonel Murray is at present officiating in Bengal for Colonel S. H. Browne, I.M.S., who recently took short leave out of India.

WE understand that Colonel T. H. Hendley, I.M.S., C.I.E., who retired in 1903, has been appointed Consulting Physician to the Church Missionary Society in London, and the salary is rumoured to be no less than £1,000 a year.

ON the departure on leave of Colonel Thomson, C.I.E., I.M.S., Major Chaytor White, D.P.H., I.M.S., acts as Sanitary Commissioner of the United Provinces.

CAPTAIN ROBERTSON MILNE, I.M.S., will officiate as Superintendent, Central Lunatic Asylum, Lahore, *vice* Major Ewens, I.M.S., going on leave.

THE
Indian Medical Gazette.

MARCH, 1905

THE PURIFICATION OF WATER BY
COPPER

ALL our readers must have noticed in the daily papers more or less sensational announcements of "a great discovery" in the method of purifying water which has been announced to the world in the pages of that admirable monthly magazine, the Century

To those who have kept their eye on the literature of the various sanitary associations, there will be nothing new in the announcement. We herewith reproduce an article read by Dr Rideal, a well-known authority, at the meeting in Glasgow of the Sanitary Institute in autumn last.

There can be no doubt that this copper method is worthy of further experiment and trial, if it is proved that the mere exposure of doubtful water in copper vessels will kill off all ordinary pathogenic bacilli, a simple method of water purification is assured.

We quote Dr Rideal's experiments here in full, as we have not met with any others of a like kind. It is possible that copper could be used for the further bacteriological purification of septic tank effluents.

"The Department of Agriculture in Washington has recently drawn attention to a new method of treating water supplies, to prevent the growth of algae and certain pathogenic organisms, by the addition of small quantities of copper sulphate. They have shown that different algae can be killed by this reagent when added to the water in parts varying from 1 to 2,000, to so small a quantity as 1 in 10,000,000, in the case of *Uroglena Americana*. The anabenas, which are frequently a source of odour in water supplies, seem to be killed by a proportion of 1 in 3,000,000.

Perry and Adams, in the Fourth Report of the Rivers Pollution, Connecticut, have found that 1 to 200,000 is not injurious to minnows and goldfish, and, in general animal life seems to be less susceptible to copper than plant life.

In this country, as is well known, the minority report as to the colouring of vegetables by copper agrees with that of Continental observers as to the harmlessness of quantities of copper for adults, even up to one gramme per day. At Ben, in Virginia, in 1901, *Spirogyra*, which had developed to such an extent in the water cress beds as to seriously handicap the industry, was eradicated by the addition of 1 to 50 million parts of copper sulphate, and 1 in 4 million parts has also been effective against filaments of *anabena*, reducing them from several thousand per cubic centimetre to none.

As to the effect on pathogenic organisms, this has been studied by Kronche, Schumburg, Green, Leveson and Slater, Vincent, and other investigators (see Rideal, 'Disinfection and Disinfectants,' pages 156 to 160), but most of the authorities seem to have advocated very much stronger solutions than those which have been found effectual for killing algae.

It was thought, therefore, of interest to carry out further experiments with copper sulphate and copper chloride with specific pathogenic organisms. The results have been as follows.

A 1 per 1000 solution of copper sulphate was made by crushing the crystals and pressing the powder between blotting paper, and dissolving in distilled water. (This solution was subsequently found to contain one part of Cu in 3825.)

A 1 per 1,000 solution of copper chloride was also made, by drying the crystals at 100 deg cent, and using the brown powder. (This was found to contain one part of Cu in 2,600, - i.e., nearly twice the amount in the copper sulphate solution.)

TABLE I
B. Coli with $\text{CuSO}_4 \cdot 5\text{OH}_2$

	Distilled water Boiled			Tap water Filtered		
	1 hr	3 hrs	20 hrs	1 hr	3 hrs	20 hrs
1 in 1,000 (=1 in 3,825 of Cu)	—	—	—	—	—	—
1 in 10,000	+	+	+	+	+	+
1 in 100,000	+	+	+	+	+	+
1 in 200,000	+	+	+	+	+	+

(*) Reinfection

B. Coli with CuCl_2

	Distilled water			Tap water		
	1 hr	3 hrs	20 hrs	1 hr	3 hrs	20 hrs
1 in 1,000 (=1 in 2,600 of Cu)	—	—	—	—	—	—
1 in 10,000	+	+	+	+	+	+
1 in 100,000	+	+	+	+	+	+
1 in 200,000	+	+	+	+	+	+

B. Typhosus with $\text{CuSO}_4 \cdot 5\text{OH}_2$

	Distilled water			Tap water		
	1 hr	3 hrs	20 hrs	1 hr	3 hrs	20 hrs
1 in 1,000	+	—	—	+	—	—
1 in 10,000	+	—	—	+	—	—
1 in 100,000	+	+	+	+	+	+
1 in 200,000	+	+	+	+	+	+

B. Typhosus with CuCl_2

	Distilled water			Tap water		
	1 hr	3 hrs	20 hrs	1 hr	3 hrs	20 hrs
1 in 1,000	—	—	—	—	—	—
1 in 10,000	—	—	—	—	—	—
1 in 100,000	+	+	+	+	+	+
1 in 200,000	+	+	+	+	+	+

From this first set of experiments one learns that with copper sulphate (1 in 5,000 copper in solution) a contact of one hour is not quite sufficient to ensure the death of *B. typhosus*, but kills *B. coli*.

Similarly with copper chloride 1 in 26,000 kills coli in three hours, and typhoid in one hour

It would seem from this that the chloride is the more active salt

Comparing the results of the sulphate and chloride on coli, it will be seen that 1 in 10,000 of the chloride killed in one hour, but that more than three hours were required with 1 in 10,000 of the sulphate. This shows that for equal weights of the salts the chloride is more efficient, but as the actual amount of copper in the two solutions was in the ratio of 3,825 to 2,600, it would seem from this preliminary experiment that the efficiency is roughly dependent on the absolute amount of ionic copper present

This hypothesis was proved to be correct by a further experiment carried out on B coli. The strength of the two salts required to kill the bacillus in three hours were found to be between 1 in 8,000 and 1 in 9,000 of copper sulphate, and 1 in 13,000 and 1 in 14,000 of copper chloride, corresponding in each case to a percentage of about 0.003 of metallic copper

With staphylococcus pyogenes aureus, this organism was similarly killed by less than two hours' contact of 1 in 7,000 of both copper sulphate and copper chloride. With the chloride, (stronger in copper,) even a solution of 1 in 10,000 was efficacious

Even metallic copper, in presence of water, produces a so called colloidal solution, which, according to Nageli, Galeotti, and Israel and Klingman, is sufficient to make the water toxic to many forms of algae and bacteria

The Department of Agriculture has shown that an area of about 1 square centimetre to each 100 cc of water is sufficient for exterminating uroglena and some forms of spirogyra from a reservoir, and suggests that this quantity would also be effective in diminishing the number of pathogenic organisms present, so much so that water standing for six or eight hours in a clean copper vessel, at room temperature, should be free from any cholera or typhoid germs

We have carried out some further experiments in this direction, using copper foil, as follows —

EXPERIMENTS WITH COPPER FOIL

Five flasks were sterilised with 100 cc of water in each and into three of them 50 square centimetres of copper foil were introduced (giving 100 square centimetres of surface). The other two flasks served as controls. Each flask was inoculated with a single loopful of the test organism, and sub cultures were made, at once, in 2½ hours, in 6 hours, and in 24 hours. The following are the results —

	Cu + B coli	Cu + St Py Au	Cu + B Ty	Control + B coli	Control + B Typh
At once—					
1000 c.c.	+	+	+	+	+
10000 c.c.	—	—	+	+	+
2½ hours—					
100 c.c.	+	+	+	+	+
1000 c.c.	—	—	—	+	+
6 hours—					
10 c.c.	—	—	—	+	+
100 c.c.	—	—	+	+	+
24 hours—					
1 c.c.	—	—	—	+	+
10 c.c.	—	—	—	+	—

These experiments are only preliminary, but seem to warrant us in concluding that exposure of water, which is open to contamination, in clean copper vessels for less than twenty four hours would be sufficient to render it safe for drinking purposes

We, therefore, are able to confirm the suggestion put forward by the American workers, and we hope that the old-fashioned prejudice against the use of copper vessels for food or drink will, in view of this recent literature, not militate against a prolonged trial of what seems to be a simple method of reducing the dangers of infection of water-borne typhoid

We are also trying the effect on sewage filtrates of passing them through copper gauzes, to reduce the number of pathogenic organisms therein, with a view to protecting water cress beds and oyster layings

Further observations were made on the green growths from London tap water, with strengths of the two salts varying from 1 in 2,000 to 1 in 5,000,000. After thirteen days' contact the bottles containing the stronger solutions showed a deposit of basic copper salt, the weaker showed no change

Under the microscope the more typical specimens were examined, in comparison with an untreated sample, in which protococcus and scenedesmus were the predominant species. The strong solutions seemed to make the cell contents more granular and of a less vivid green, but with a dilution of 1 in 10,000 the change was not marked

It was further noticed that the protococcus forms seemed to be more predominant in the presence of the weaker amounts of copper, pointing to the conclusion that it was more easily attacked than the scenedesmus forms

The above experiments appear to us to be of great value and should be repeated in India. As we said above the difficult question of the disposal of the effluents from septic tanks may possibly be solved by the use of copper, and the statement which we have italicised above points to the use of copper vessels for the storage of drinking water, a matter which it is clear would be of enormous importance both in private life and for armies in the field

The case for copper is, we consider, one now needing further investigation

LONDON LETTER, 1904

THE LEISHMAN-DONOVAN BODY

THE researches to which I referred in my last letter have been briefly published in the January number of the *Journal of the Royal Army Medical Corps*, and a more detailed account of them will appear in the next number. They were executed by Captain Statham, R.A.M.C., Pathologist to the Royal Victoria Hospital, Netley, assisted by some of the Lieutenants of the Indian Medical Service, who were undergoing a

course of instruction at Netley in November and December. The subject of these investigations was a case of so-called Dum-Dum fever and, the object of them was to test Captain Leonard Rogers' observations regarding the transition of the Leishman-Donovan body into trypanosome forms under special conditions of cultivation. Captain Rogers' results were fully confirmed, and Leishman's original surmise verified. A most important step has thus been gained in our knowledge of these organisms, but a great deal of work still remains to be done with respect to their natural history and pathogenetic properties. Unfortunately these researches have somewhat unsettled our views regarding the causation of diseases hitherto reputed to be of malarial character and due to organisms credited with the power of causing these. Speculations as to the clinical affinities and diversities of malarial and non-malarial fevers seem vain and infructuous, so long as ignorance of the zoological and pathological facts relating to these organisms remains.

There is nothing left but to obey the precept of the American poet and content ourselves to labour and to wait, knowing that many earnest and capable men are applying themselves strenuously to the solution of these great problems.

SANITARY REFORMS IN INDIA

The reconstitution of a special Imperial Sanitary Department is undoubtedly an important step as emphasising the determination of the Indian Government to pay special attention to sanitary matters and obtain the best available advice regarding subjects affecting public health. The best feature of the new order of things is, I think, the resolve to organise research laboratories in the chief centres of administration. But what of the Sanitary Executive? It is, I fear, too much the habit in Indian administration to create administrative heads and neglect the body and limbs by which these may become effective. The result had hitherto been, in too many instances, the compilation of able reports founded on rotten statistics and meagre—often erroneous—information and the neglect of work whether designed to obtain information or to apply information already gained. What unsanitary India really wants is cleansing, and the provision of an intelligent and efficient agency for that purpose is the prime desideratum. It seems an inversion of the real position

to create a central organ of inquiry and control and to leave municipalities and other local authorities to collect and spend as little or as much money as they may incline to on health purposes. Sanitation, like charity, should begin at home, and it is in relation to the person, family and community that sanitary education and effort are in the first instance necessary.

K Mc L

Current Topics.

AS OTHERS SEE US

WE quote the following extracts from an article entitled "Travel Notes" by Dr. Nicolas Senn, the celebrated Chicago Surgeon, from the pages of the *Journal A M A*, November 26th, and December 23rd, 1904, &c —

I MADRAS HOSPITAL

India with its 300,000,000 inhabitants has only four medical colleges, located at Madras, Calcutta, Lahore and Bombay. All of these medical schools are in affiliation with the respective universities. On recommendation of the medical faculties the universities confer the degrees, but the medical schools receive no financial aid from the universities and set their own standards of requirements for admission and graduation. All the medical schools are patterned after those of the United Kingdom as to requirements for admission, graduation and methods of teaching. From information obtained from different sources I find that the great stumbling block of the Indian medical student is language. A knowledge of Latin is a *rara avis*, and the meaning of ordinary English words is hard for them to express and comprehend. The teachers find this imperfect knowledge of the English language the greatest drawback in ingrafting their ideas into the minds of the students. The number of medical students in the different institutions at the present time is about 2,000. Very few Mohammedans study medicine, the great majority of students are Hindus and Parsees. The Hindus are said to be the brightest students. The classes have increased in size very rapidly during the last few years, so rapidly, indeed, that space and equipment in all of the schools have become entirely inadequate. From what I have seen of the students in the different medical colleges I have become impressed with their lively, cheerful dispositions and their earnest devotion to their work. The teaching force, as a rule, is inadequate in number in all the schools, and in consequence the men are overworked. I will give only one striking instance of this kind. Lieutenant-Colonel Dimmock of Bombay is director of the Jamsjee Jeejeebhoy Hospital principal of Grant Medical College, and professor of obstetrics, gynaecology and diseases of children. Enough work for five men under ordinary circumstances. *The men of the Indian Medical Service who are engaged in medical teaching are overworked and underpaid, and they are the men who do more for India than any other class of men.*

MADRAS MEDICAL COLLEGE

The Madras Medical College was originally established as a medical school in 1835. The classes received their instruction at first in rooms adjoining the quarters of the Surgeon-General of the General Hospital. The main building of the school was opened in 1836 and then consisted of four apartments—a theatre or lecture room, a library, a museum and a laboratory. The school commenced with a teaching force of seven

ten medical apprentices and eleven native medical pupils. Private students were first admitted in 1838. They obtained, in common with Government students, a free education. In 1851 it became a college, and in 1857 it was placed in the list of affiliated institutions. The buildings were altered and enlarged in 1867. In 1885 separate anatomic buildings were erected, to which were added a theatre with a dissecting room for the pupils of the hospital assistant department and a museum in 1887-88. Separate buildings for biologic and hygienic laboratories followed. In 1875 the college admitted on its rolls three new classes of students, viz., candidates for the degree of licentiates in medicine and surgery, for the new grade of civil apothecary, and female students. The system of free education for the students of the college department was abolished a year before this department had been closed, in order to allow the professors to devote themselves to the teaching of subordinates for the service of Government. For the second time the hospital assistant department was transferred to the auxiliary medical school at Rava-puram in 1903. The principal of the college at the present time is Lieutenant Colonel J. Maitland, M.D., I.M.S., F.M.C. The teaching staff consists of 23 professors and assistant professors, and the number of students is 400. Major G. G. Giffard, I.M.S., is professor of surgery, and Miss V. Adams, M.B., lecturer in midwifery to female students.

The candidates for the M.B. and C.M. section must have passed the first examination in arts of this university, or an examination accepted by the syndicate as equivalent thereto. The course of training for this class extends over five years.

MADRAS GOVERNMENT GENERAL HOSPITAL

This institution is intimately connected with, and in fact is, the clinical part of the Madras Medical College, all of the attending physicians and surgeons, being members of its faculty. The hospital is made up of a number of two-story pavilion buildings around a capacious square court ornamented with tropic trees, shrubs and flowers. The buildings harmonize with each other. It can accommodate 450 patients. The amount and variety of clinical material in this institution is simply enormous. The operating theatre, while not up to all of the modern requirements, is one of the best in India. Chloroform is the routine anæsthetic. The favourite suturing material is silk and silkworm gut, as the use of absorbable sutures has given rise to many disappointments. Bimoid of mercury is the favourite antiseptic for hand and surface disinfection and sterilized gauze is used for dressing wounds. I found a great many emergency cases in this hospital, fractures and accidental wounds, as well as a number of cases of abscess of the liver recently operated on. Among the most important cases was a man who was admitted into the hospital a few days previously with a strangulated inguinal hernia of four days' standing. Professor Giffard performed the operation. The bowel was gangrenous. Enterectomy was done, the continuity of the bowel restored by suturing and the patient is recovering without having shown any untoward symptoms since the operation. Although inguinal hernia is met with quite frequently in Madras, femoral hernia is very rare, only one case being admitted to the hospital during the past 20 years—(Giffard). Elephantiasis of the scrotum is very frequently operated on in this hospital. Lieutenant-Colonel Maitland has performed this operation 180 times with most excellent immediate and remote results. Stone in the bladder is very common in this part of India. Crushing is the favourite operative procedure. Many surgeons, among them Professor Giffard, prefer to perform the operation through a median perineal incision instead of the urethra, and in case the stone is too large to be removed by this method it is extracted either whole or in fragments through a suprapubic incision.

CARCINOMA IN INDIA

An unusual number of cases of cancer of the mouth find their way into this hospital and its frequency is attributed by the surgeons to betel chewing. Two pathologic forms are distinguished, the papillomatous and ulcerative, the latter being much more malignant and pursuing a very acute course. Captain W. J. Niblock, I.M.S., Surgeon, Government Hospital, has contributed a very important article to the literature of "Cancer in India," published in the *Indian Medical Gazette*, May 1902. The paper is based on the clinical records of this hospital. He has the following to say regarding betel chewing as a cause of carcinoma of the cheeks and jaws. "On looking at Table 1A one can not avoid being struck very forcibly by the enormous number of patients shown as admitted for carcinoma of the cheek and jaws. Carcinoma of the cheek alone accounts for almost one-third, and carcinoma of the cheek, jaws and tongue taken together for more than one-half of the total admissions. The cheek is the part most commonly affected in Hindus and Mohammedans, males and females. The disease affects the buccal surface of the cheek, generally commencing opposite the teeth of the lower jaw and spreading with varying rapidity. The frequency of carcinoma in this situation is, in my opinion, due to the chewing of 'betel,' a common habit in this country, and indulged in, I believe, by almost all classes of natives. 'Betel,' as used in the Madras presidency, is said to be made up of the following parts: (a) The essential constituents, viz., 'betel' leaf, areca nut, and caustic lime (chunam). (b) Condiments, such as cloves, nutmeg, cardamoms, cubebs. Dry powdered coconut and oil are also sometimes added. The above components are mixed in varying proportions, rolled up in a betel leaf, and placed in the mouth. They are then chewed and rolled about by the tongue and cheek for a period varying from 10 to 30 minutes and then spat out."

I can testify from observation to the universal use of betel both in India and Ceylon. Carcinoma of other parts of the body appears to be more rare than in our country. The tables of Captain Niblock show, for instance, that 513 cases of carcinoma of the mouth were admitted to the General Hospital during ten years, 1892-1901 and only 44 cases of carcinoma of the breast and 19 of the lip. Concerning the latter location he says: "Epithelioma of the lip, it will be noted, is comparatively rare and, so far as my experience goes, affects both lips with equal frequency. The rarity of carcinoma in this situation is no doubt explainable by the fact that smoking from a pipe (or at any rate a clay pipe) is not indulged in by natives of this country." The comparative frequency of carcinoma of the upper lip referred to by Captain Niblock stands almost isolated as a clinical observation and constitutes a very important contribution to the topography of carcinoma as it is observed in India. Hundreds of cases of carcinoma of the lower lip have come under my observation and only a single case of carcinoma of the upper lip.

ABSCESS OF THE LIVER

In visiting any of the large hospitals in India one is sure to find a few cases of abscess of the liver, and yet Captain W. J. Niblock says the disease is not so frequent as is generally supposed. (Notes on operations for abscess of the liver, ascites and gallstone. *Indian Medical Gazette*, November, 1903.) In looking through the reports of the Madras General Hospital, he found that during the ten years, 1893-1902 inclusive, only 154 cases were operated on and during the last three years the average annual admissions were at the rate of 63,591. Of the 154 cases recorded, 21 were shown to be multiple, all of whom died. There were 53 deaths among the 133 other cases, several of which were, however, probably multiple, as some of the surgeons who performed the operations made no distinction between single and multiple abscesses in their records. Captain Niblock reports the result of 29 cases of abscess of the liver operated on

by himself from March 25th, 1899, to September 21st, 1903. All the patients were males, their ages ranging between 24 and 70. The racial distribution was as follows: Hindu, 19, Eurasian, 3, European, 5, Mussulman, 2. Out of the 29 cases five were multiple, all of whom died. Among the remaining 24 there were six deaths, that is, the mortality was 25 per cent. All of the abscesses containing less than 20 ounces of pus at the time of operation recovered. In the treatment of this affection the author of the paper emphasizes the importance of a preliminary exploration of the liver by means of a long needle and syringe.

His directions for exploring the liver areas follows: "If a distinct prominence be felt or seen, the needle is first introduced at that situation. Where no such prominence exists, the needle is usually introduced into the liver through the ninth or tenth intercostal space. After the liver has been pierced, the piston of the syringe is drawn back for an inch or so, leaving a vacuum. Should pus now enter the syringe, the latter is detached, leaving the needle sticking in the liver to act as a guide. If no pus be found, the needle is gently pushed upward, inward and slightly backward, this being the most likely direction in which to strike pus. It is gradually withdrawn if no pus is found, and reintroduced in another direction. Five or six different parts of the liver are thus carefully explored before the case is sent back with a negative result." The exploration is made under an anæsthetic and if pus is found the operation is performed at once. After resection of about two inches of the ninth or tenth rib in the axillary line the liver is exposed by an incision. If adhesions are present the liver is incised at once, if there are no adhesions a strip of gauze is carefully packed all around the proposed line of the visceral incision. Sutures are never used, as they tend rather to favour than prevent the escape of pus into the serous cavities. With a small scalpel the capsule of the liver is incised. If the abscess is deeply situated a sinus forceps is pushed through the liver substance into the abscess, followed by the index finger and the needle is then withdrawn and one or two Keith's glass drains inserted. After evacuation of the pus one or two large fenestrated rubber drains are substituted for the glass drains and a large aseptic absorbent dressing applied. Washing out of the cavity with antiseptic solutions is abstained from, although the operator has seen good results from the use of a solution of quinine, 1 in 60 to 1 in 80, as advised by Captain L. Rogers, I.M.S.

The nursing in the Madras General Hospital is in charge of 28 trained female nurses, 51 male ward attendants and 21 female ward attendants. Twelve female nurses resigned during the year and gave their reasons for this step as follows: Left to be married, six; left to train as midwife, one; retired on pension, two; retired on account of ill health, two; retired for private reasons, one.

The amount of available clinical material of this hospital is something enormous. During the last year the institution cared for 60,842 out patients and 7,177 inpatients. The total number of deaths that occurred in the hospital was 644. Among the most frequent causes of death we find malaria, 48, dysentery, 46, tuberculosis, 83, diseases of liver, 38, diseases of the urinary organs, 40. Cholera is credited with five deaths. Only five deaths occurred from septic diseases acquired in the hospital. They were as follows: One case of septicæmia, one case of septic peritonitis after enterectomy, one case of erysipelas after operation on tubercular glands of the neck, one case of cancerum oris occurring in a patient suffering from malaria, and one case of gangrene of the leg following the puerperal state in a debilitated woman.

Forty-eight deaths occurred in cases of septic diseases required outside of the hospital, namely, sixteen from tetanus, nine from cancerum oris, nine from cellulitis, three from gangrene, two from sloughing after extravasation of urine, one from sloughing of scrotum, one

from sloughing phagedæna of the penis, and seven from septicæmia (two puerperal).

The total number of operations performed was 6,281, with a mortality of only 1.9 per cent. Among the more important operations were 43 for elephantiasis of the scrotum, with one death, eight suprapubic cystotomies for stone, with four deaths, one death following a median perineal operation and two lithotomies, with one death, 61 operations for hæmorrhoids without mortality, seven by ligature, three by excision and 51 by clamp and cautery, ten operations for extravasation of urine, with one death, 700 operations for hydrocele by tapping, with injection, incision and eversion of sac, excision of parietal part of sac and incision and drainage, 31 castrations without a death, five operations for prolapse of the rectum, with one cured, two relieved and two deaths, 26 operations for strangulated hernia, with nine deaths, and 102 radical operations, with three deaths, 31 operations for abscess of the liver, with three deaths, and 15 exploratory punctures of the liver, with 1 death from hæmorrhage, six exploratory laparotomies, with two deaths, three operations for intestinal obstruction, with two deaths, five excisions of the appendix, with one death and five incisions for appendiceal abscess, with one death, six amputations of the thigh, with one death, and ten amputations of the leg, with one death.

There are no gynecologists connected with the Madras General Hospital, attending surgeons being in charge of all surgical cases regardless of sex. The hospital has nine private rooms, for which the patients are charged from 2 to 5 rupees a day.

Bubonic plague cases occasionally find their way to Madras, but the sanitary precautions are so stringent that the disease has never gained a foothold here. Every stranger who arrives at Madras, by boat or railway, is kept track of by the police for ten days, the maximum limit of the period of incubation of bubonic plague.

II CALCUTTA HOSPITALS.

The medical interests of Calcutta, a city of great commercial importance, with nearly a million of inhabitants, center in the Bengal Medical College and the Government General Hospital, its clinical department college and hospital are located on the same spacious grounds, artistically laid out, intersected by well made and well kept walks and ornamented with trees, shrubbery and flowers. Both institutions are managed by officers of the Indian Medical Service, who constitute the faculty of the college and attending staff of the hospital, thus cementing together the didactic and clinical teaching and uniting them practically under one administration, and securing uniformity in the methods of teaching and a systematic progression of the courses from term to term and year to year.

BENGAL MEDICAL COLLEGE

The Bengal Medical College was founded in 1830, and from a small beginning has gradually developed into a great medical school with an attendance at the present time of about 600 students. The original structure is an imposing, massive stone building with graceful fluted columns and broad stone steps on the side of entrance. The college, as well as the hospital which in reality forms an integral part of it, had to be enlarged from time to time in order to accommodate the rapidly increasing number of students. The requirements for admission and graduation correspond with those of the other medical colleges of India. Separate laboratory buildings have been erected, well adapted for the purposes for which they are intended and fairly well equipped. The medical classes are very much mixed, not only in nationality and colour, but also in the different aims pursued by the students. Thus there are "regular" and "casual" students, the former continue their studies for five years with a view of passing the final examinations for the I.M.S. or M.B. degree, the latter are permitted to take a partial course of lectures or any department of hospital practice, with the permission of the principal.

of the school and the professor, on payment of the fees in advance at the fixed rates

Then there are special provisions made for female medical students and military pupils. Admission to the female certificate course is granted by the principal, provided the student has passed the preliminary arts examination. Admission to the military pupil course is regulated by the Director-General of the Indian Medical Service. I am particularly anxious to define in connection with the Bengal Medical College the status of female medical students in the medical colleges of India. Female students may enter (a) as regular students for the university course, (b) as female certificate students, (c) as casual students. The preliminary arts examination required before entering is (a) the F.A., Calcutta, or its equivalent, (b) the entrance, or its equivalent, (c) the entrance, or its equivalent. A student who has entered for the university course may be permitted by the principal to change her plans of studies at any stage, and to join the certificate class instead. Female students entering as regular or female certificate students are eligible for a Government scholarship, 20 rupees per month, and are not charged any fees.

MILITARY PUPIL CLASS

The present attendance of Bengal Medical College includes 96 military pupils, who at Government expense, are being educated for the subordinate Indian Medical Service. These students are in uniform and reside in a separate building across the street from the college and besides pursuing their routine studies are drilled daily by a retired captain of the Indian Army, who at the same time exercises supervision over them and is responsible for their conduct outside of the college precincts.

Female medical students, who enter the certificate class, continue their studies for four years and are required to pass a satisfactory examination.

In the whole curriculum there is only one optional branch—dental surgery. The English teachers of medicine and surgery believe in the wisdom of making the attendance on all lectures and clinics obligatory, as it should be. Some of our best American medical colleges are making a serious mistake in giving the students too much liberty in the choice of their studies, the results of which must necessarily be a fragmentary and imperfect knowledge in some of the most important branches they are expected to master. Optional liberties in a medical college are as harmful as they would be if they were introduced into our primary schools. Students thus privileged will only learn enough of the branches that are distasteful to them to squeeze through the final examinations and no more. Optional studies are in place in postgraduate education, but should not be countenanced in a medical college whose function it is to instruct the students systematically and thoroughly in all branches pertaining to medicine and surgery.

The Bengal Medical College has undertaken the education of midwives—a very commendable extension of its wide field of usefulness.

Women, who have a fair knowledge of English, but who have not passed the entrance examination or its equivalents, will be admitted into the Eden Hospital to learn midwifery.

Major F. J. Drury, M.S., is principal of the college, and Professor Bird occupies the chair of surgery.

CALCUTTA GOVERNMENT HOSPITAL.

The Calcutta Government College Hospital is virtually the clinical part of the Bengal Medical College. The different pavilions and laboratories form a group of buildings of which any city and country might well be proud. The Eden Hospital, a separate new modern building, is the maternity in which about 600 women are delivered every year. The strictest cleanliness prevails throughout this building and sepsis in in-patients is almost unknown. The woman in labour is prepared with the same care as for a major operation, and everything brought in contact with her during the delivery and lying in period is carefully disinfected

(hands) and etherized (dressings). The delivery room has all the aspects of an operating room. Three tables are always kept in readiness. Mother and child remain in the hospital from ten to fourteen days after delivery. The Ezra ward, with forty beds, the gift of a rich Jew, is for the exclusive use of Jews. The original hospital building is an old-fashioned two story solid stone building which in the light of modern improvements would appear somewhat antiquated if it were not for the electric lighting and electric punkah motor. The latter is kept in motion night and day during the hot season and is a source of immense comfort to the patients. The hospital can accommodate 450 patients and has a few private rooms, for which a charge of two rupees (64 cents) a day is made. The operating room has a small amphitheatre, which affords standing room for the students, but lacks many of the conveniences and appliances considered at the present time so essential for aseptic surgical work. As in all hospitals in India, chloroform is the favorite anæsthetic and the bichlorid of mercury takes the first place as an antiseptic. Buried sutures have been abandoned almost entirely, and the removable silk and silk worm gut sutures are in general use. The nursing is in charge of two Anglican sisters, who are also at the head of a recently organized training school for female nurses, which has now an attendance of forty pupils. Male and female ward attendants assist the nurses in their work. The pupil nurses are Europeans or Eurasians and remain for only one year in training.

Among the more interesting cases Professor Bird showed me five patients recently operated on for abscess of the liver. All were doing well, although greatly emaciated from the effects of the disease. Abscess of the liver appears to be extremely common in this part of India, as Professor Bird not long ago operated on twenty cases in two months. Carcinoma in all its forms is met with here with about the same frequency as in Europe. Acute osteomyelitis and surgical tuberculosis, on the other hand, are comparatively rare. Syphilis and gonorrhœa are very common, but in the native both of these diseases pursue a benign course. Enlargement of the prostate gland in the aged natives is very rare. This statement is confirmed by all surgeons I met in India. They can offer no explanation for this, but there must be something in their habits or manner of living that protects them against this curse of advanced life so common among Europeans and Americans. Stone in the bladder is very common, but comparatively few of these cases enter the hospital, as they are operated on by physicians who practice in the country districts, the operation being regarded by them as a safe and easy one.

A chronic parenchymatous inflammation of the mammary gland in young men is of frequent occurrence here and is usually treated by excision. Cystitis is very rare as compared with our hospital experience. Two reasons might be advanced to explain this: the rarity of prostatic hypertrophy in India and the very mild course gonorrhœa pursues in the natives.

Professor Quicke of Bombay made the statement to me that he never knew of a Rajah to enter on a catheter life. Tuberculosis of the kidney and bladder is also infinitely more rare in India than in our country. As is the case with all coloured races, the natives of India are very subject to benign tumours, especially fibroma, keloid, lipoma, papilloma and cystoma. On the other hand, affections of the veins, hæmorrhoids, varicocele and varicose veins of the lower extremities are not nearly as frequent as with us. Among the thousands of bare legged men I saw in India I did not observe a single instance of well-marked varicosity and, considering the enormous clinical material that passes through the large hospitals, the number of operations for hæmorrhoids and varicocele is astonishingly small. Laxative vegetable diet, active exercise, absence of tendency to obesity and looseness or absence of dress will go far to explain the comparative freedom from

disease of the hæmorrhoidal, spermatic and saphenous veins, a suggestion which might be of some service to our numerous sufferers from plethora, obesity and stagnant venous circulation.

In the medical wards I found here as in all hospitals in India, the greatest variety of malaria and its multitude of complications. A large part of the hospital space is occupied by malarial patients, and the physicians here have an excellent opportunity throughout the entire year to study malaria in all its endless clinical and pathologic aspects.

What an excellent place Bombay or Calcutta would be for a great school for the study of tropical diseases! The material is here, and not in London, nor Liverpool, and if utilized to greatest advantage it must be studied here and not thousands of miles away from where the diseases had their origin.

Typhoid fever is not so common as we would suspect after an inspection of the water supply and insanitary environments of the masses of the natives. The native prefers to draw his water from the well that has served his ancestors for centuries rather than from the tap of the modern water works. If it is at all within reach, water from the sacred Ganges is his favourite drink. Most of the cases of typhoid fever I examined in the different hospitals of India, were of a mild type, and the mortality from this disease as published in the hospital reports is not great.

India has its share of pulmonary tuberculosis, but for reasons that can not be explained tuberculosis of bones and joints is very rare as compared with the frequency with which this disease attacks our childhood population. In any of our large hospitals we see ten cases of joint and bone tuberculosis to one in the hospitals of India, and on the streets of Chicago ten cripples from this disease to one in India. The same remarks apply to tuberculosis of the lymphatic glands and genito-urinary organs. Diarrhœa, dysentery and malaria are the prevailing diseases of India and it is these afflictions that tax most heavily the therapeutic resources of the physicians, both in hospital and private practice. In this as well as in all clinical hospitals of India, much stress is placed on the practical training of the students, more especially by bedside instructions. The out-patient department is utilized to the greatest advantage and it is here that the students are given the very best opportunities to come in touch with the patients. Under the supervision and guidance of the professors or competent instructors, they are required to make thorough clinical examinations, apply dressings and assist in the operative work, and the last year students are privileged to perform some of the minor operations.

The average medical student in India has a keener taste for practical work than for scientific research, and consequently makes good use of his clinical opportunities. The female medical students are no exception to this rule, although it is generally admitted that at the end of the curriculum, in consequence of a more diligent attendance on the didactic lectures and a more liberal use of midnight oil in reading their text books, they are ahead of their male colleagues in the theoretical knowledge of medicine. The male medical students are very fond of all kinds of athletic sports, and the time spent by them in developing their physical strength is made use of by the women in committing to memory the contents of their text books. Then, too, the young men spend more time in amusements when away from the playgrounds and out of the hospital and lecture rooms than the young women, who have less desire in this direction and are kept under stricter supervision.

If I had any criticism to offer on the methods of teaching clinical surgery in India I would say that the clinical material and specimens obtained by operations and *post-mortems* are not made use of to the greatest advantage for the benefit of the students. Pathology should be made the most important feature in the teaching of surgery as well as of medicine. In defence

of this apparent neglect it must be said that the clinical teachers in some of the colleges are without the necessary appliances and equipments to give surgical pathology the prominence it so well deserves.

It was in the pathologic laboratory of the Bengal Medical College that I was given an opportunity to examine a new parasite, the *Plasmodium donovani*, through the courtesy of the director of the laboratory, Captain L. Rogers, M.C. He was also kind enough to furnish me with several mounted slides containing this parasite so recently discovered by Leishman and Donovan. In another place I will give a more detailed account of this parasite, history of its discovery and etiologic relationship to splenic anemia. Medical science is much indebted to the researches of the members of this corps, all of whom are indefatigable workers in a climate well calculated to undermine physical strength and paralyze mental activity.

III BOMBAY HOSPITALS

Bombay, with its 800,000 inhabitants is the commercial metropolis and medical centre of India. The city has many and varied medical institutions that awaken the interest of the professional visitor. The most important among these is the Grant Medical College, the largest medical school in India. For sixty years it has been the Mecca for native young men in that part of India who were desirous of entering the ranks of the medical profession. Thousands of graduates have left its doors well prepared to serve their countrymen as reliable and competent physicians. From a modest beginning it has developed into a great medical school with an attendance of more than 600. The personnel of the students is an interesting one. The mixture of colours, from the almost pure white of some of the Eurasians to the coal black of some of the Hindus, and the variety in dress, from Parisian to the most picturesque costumes makes up an interesting picture for the foreigner.

The Mohammedan population of India is large but, as a rule, its young men manifest little desire for a higher education and the number of medical students from this source is small. On the other hand the Hindus take kindly to the professions of law and medicine and the bulk of the medical students is recruited from this high caste Hindus. The Parsee element of the population is well represented in the medical schools, and the strange head-dresses of the males of these people figures conspicuously in all the class rooms.

The female medical students number about sixty and, with the exception of two or three white women, they are Hindus, Parsees and Eurasians. What are known as half castes in Ceylon are designated in India by the more euphonious word, Eurasians meaning a mixture of Europeans with Asiatics. The female medical students have won for themselves here, as elsewhere, an enviable reputation as enthusiastic, hard workers, who, when the time for graduation comes are never found at the undesirable end of the class. Their subsequent professional career is often, however, a very checkered one. Some receive hospital positions with small salaries of rupees 100 to 200 (\$32 to \$64) a month, others enter private practice, but seldom meet with great success, some marry, and not a small percentage sooner or later abandon their profession and turn their attention to some other vocation.

The professors are selected from the Indian Medical Service with special reference to their aptitude to teach the different branches. The principal chairs, medicine, surgery and obstetrics, are occupied by men who have had an extensive experience, while the primary branches, especially pathology and bacteriology, are usually taught by the younger members of the service. Native graduates hold subordinate positions in the teaching force as assistant professors, instructors, demonstrators, tutors, etc. The professors who belong to the civil branch of the Indian Medical Service receive a salary according to their military rank and in addition they receive some remuneration from the college for the service,

so that, for instance, a lieutenant-colonel who has been in the service for 20 years may have an annual income of \$4,800. In the event of his death, his widow receives a pension of \$750 a year and each of his children \$150 a year—the sons until they reach the age of 21 years and the daughters until they become married. The pensions are provided by a fund to which each officer contributes. When an officer gets married he pays into this fund 2,000 rupees (\$640), and 1,000 rupees (\$320) after the birth of every child. At the end of 25 years, on retiring, he receives a pension of \$2,500 a year. The teaching duties of these men are so exacting that they are given but a slight chance to increase their income by private practice, which is, however, permitted.

The original Grant Medical College, so called in honour of one of the former governors of Bombay, is a substantial, venerable two story stone building. With the increasing demand for space, additional buildings have been erected. The anatomy building, now nearing completion, is a two story, massive stone building, with marble floors. The upper story is the dissecting room, which is flooded with light from all directions. It is unquestionably the finest dissecting room in the world. Connected with it is a small separate building, covered with wire screen for the purpose of excluding vultures and crows in which the bodies are prepared and the bones of the dissected subjects are cleaned and mounted.

The chemical and pathologic laboratories are inadequate for the present requirements and it is hoped that separate buildings will soon be erected for each of these very important primary branches. With an ever increasing attendance, the lecture rooms will also soon become too small. The curriculum of study for the M.B. and B.S. degrees extends over five years.

Fourth year students and third year military pupils attend in rotation at the male out-patient rooms as arranged by their teachers. Female pupils attend at the female out-patient rooms. Four and five didactic lectures, from 10 to 3 or 4 P.M., are delivered daily except Saturday, on which day only two lectures are given, during the forenoon. The clinics in the Jansetjee Jeejeebhoy Hospital begin at 7 or 7.30 A.M. and are held daily. This is the hospital in which the clinical teaching in medicine and surgery is done exclusively. The present teaching staff consist of eleven professors, one demonstrator and eleven tutors. Lieutenant Colonel H. P. Dimmock, M.S., is principal of the school and professor of obstetrics, gynaecology and diseases of children, and Lieutenant-Colonel Quicke, M.S., is professor of surgery, operative surgery, and surgical anatomy.

The final examination in this college appears to be quite a severe one, as every year only about 45 per cent of the candidates for graduation are recommended to the Bombay University, with which the college is affiliated, for the degree. Those who fail may come up again for examination at the close of the next or of any other subsequent term.

The military pupils are prepared for the assistant surgeon branch of the Indian Subordinate Medical Department. They must be of European or Eurasian parentage, not less than 16 and not more than 18 years of age.

PATHOLOGIC MUSEUM

The pathologic museum of Grant Medical College contains a very large amount of material illustrative of tropical diseases. It is the result of accumulation of specimens for 60 years and should contain more than it does, but the opposition to *post-mortem* examinations is so violent and persistent that permission is only seldom obtained. No Parsee corpse has ever been touched by a pathologist except under medico-legal pressure. Not many years ago a *post-mortem* was made on a Mohammedan and when the fact became known it gave rise to a riot in the hospital grounds which it was found difficult to suppress. Since that time the Mohammedans employ a salaried guard, who watches the approach of

grim death in the hospital, and, if the patient is a Mohammedan, he sees to it that the corpse escapes the *post-mortem* knife. The Hindus furnish the material for the museum almost exclusively.

This unreasonable objection to *post-mortem* examinations by a large proportion of the population of Bombay has seriously interfered in collecting a larger material. A catalogue of specimens in the Pathologic Museum was prepared by Captain G. F. Gordon, M.S., in 1903, and was published by the Government in the form of a well bound and well printed book of 247 pages. I will quote here a description of only a few of the most interesting specimens.

Pneumonic Plague.—The lung is solid throughout, greatly enlarged, and the visceral pleura covered with slate coloured blotches, which are subserous hæmorrhages. This specimen was from a patient aged 26, who was ill about three days. One section of the lung was filled with light coloured masses, which were surrounded by areas of acute congestion. The lower were more markedly affected by consolidation than the upper lobe. There were several hæmorrhages in the cellular tissue of the posterior mediastinum, and the other viscera were acutely congested.

Syphilitic Fibrosis of the Lung.—A portion of the left lower lobe, showing broad bands of fibrous tissue running through it, the largest proceeding from the base of lung in an upward direction. The section shows very little lung parenchyma, and that in a most condensed state. Numerous openings of vessels and dilated bronchi are seen, closely agglomerated from the shrinking process which has gone on. The affected portion of the lung seems to be shut off from the more healthy part by a broad band of fibrous tissue. The specimen was taken from a man whose leg was amputated for chronic ulceration, a Hindu, aged 40 years. There were a few caseous nodules in the right lung, the capsules of the liver and spleen are greatly thickened, specially of the latter. There was a gumma in the spleen, both testicles had undergone fibroid degeneration with thickening of the tunica vaginalis. There was a left hydrocele.

Aneurism of the Heart.—At the upper posterior part of the left ventricle, immediately to the right of the mitral valve, is a pouch condition of the septum measuring fully $1\frac{1}{2}$ inches across at its mouth and an inch deep at the deepest part. The pouch is lined with thick, opaque endocardium. The right group of chordæ tendineæ is thickened. There is thickening and contraction of the mitral orifice. In the right ventricle is a patch of opaque endocardium at a point covering the pouch in the septum. The patient was a male Mohammedan aged 60, ill for weeks. The aorta was atheromatous, a breaking down gumma was found in the liver, the capsule of which was extensively scarred. The right kidney was atrophied and contained sand like calculi, left kidney hypertrophied, fibroid left testicle, ulceration of large intestine. It is suggested that it is a case of syphilitic myocarditis, with resulting fibroid degeneration causing weakening of the septum.

Malarial Hepatitis.—Section of a highly pigmented liver, which is hard and has a mottled appearance on the surface. The surface of the section is granular. Such livers are as a rule, slightly enlarged, uniformly tender, associated with slight jaundice, some evidence of bronchitis at the base of the right lung, and therefore they are often difficult to distinguish from cases of hepatic abscess.

Hepatic Abscess.—This shows the upper surface of the liver, where an abscess had burst through the diaphragm. There were three large abscesses in the right lobe. One had intricate connection with diaphragm, which formed the upper wall of the abscess cavity. In this were two minute perforations, which communicate through the thickened pleura, with a pneumonic patch in the base of the right lung. The patient was a Mussulman, aged 28. The illness commenced with an attack of dysentery, three months prior to admission. No signs of dysenteric ulcerations were found in the bowel at the *post-mortem* examination.

Enormous Calculus of the Bladder—This stone (uric acid and urates) is probably one of the largest stones ever removed from the human bladder. About half of the stone is shown in the central compartment and the fragments are grouped around it. The operation in this case was performed in 1876 or 1877 by the late Apothecary Writs at Tando Alyhar Dispensary, near Hyderabad, in Sindh. The patient was a man, 25 years old, and had suffered from symptoms of stone since childhood. An attempt was made to extract it by the lateral operation, but this being unsuccessful, the suprapubic operation was performed. Even now it was found impossible to extract the stone. By means of some improvised instrument (a craniotomy forceps), the stone was broken in pieces and removed. The patient lived for about twelve hours after the operation. The weight of the stone was 30 ounces and 95 grains.

Ainhum of the Small Toe—This curious condition generally commences on the inner and plantar surface of the little toe. It begins as a narrow groove on the skin which slowly deepens. The groove involves the whole circumference of the digit, the distal portion of which swells up as if it had been constricted by a ligature. The digital portion finally becomes a round, dangling mass and, after some years, drops off. The fourth toe is next affected, and so on.

Mycetoma or Madura Foot—The shape of the foot is characteristic. The disease is absolutely localized to the foot, the circumference of the leg above the ankle not being increased. The skin of the foot is covered with pellets, some of which have been cut across to show the yellow fatty material of which they are composed. A window has been cut on one side of the foot. A capsule of thick, dense, fibrous tissue envelops the foot and this hardened tissue is honeycombed with small cavities, which lodge the yellow bodies in the interior of the bone, which has fallen away from the tissues and which can be seen riddled with large communicating cavities. The specimens were obtained by amputation and presented to the museum by the operator, Professor Quicke.

Anæsthetic Leprosy—A dissection of a leprosy foot made by the late Dr. Van Dyke Carter. The nerves are considerably thickened, especially on the plantar surface. The great toe has been lost, and all the digits, except the middle one, are partially absorbed.

Guinea Worm—This is a long, thin worm from 12 to 40 inches long. The female only is known as a parasite in the human body. It wanders into the loose subcutaneous tissues of the leg, scrotum and sometimes the upper limb, and there generally forms an abscess or it may form a vesicle from which the extremity projects, when it can be gradually removed by slow traction extending over some days, the protruded portion being wound round a stick.

Jamsetjee Jeejeebhoy Hospital—The Jamsetjee Jeejeebhoy is one of the oldest and best known of the many Bombay hospitals. It bears the name of the Parsee who built it at his expense and presented it to the Government in 1845, the same year that Grant Medical College opened its doors to medical students. Mr. Jamsetjee Jeejeebhoy was a poor man, but made a fortune by buying and selling bottles nearly a century ago, hence the hospital is still well known under the name of "Bottle Hospital." Mr. Jamsetjee Jeejeebhoy was knighted by Queen Victoria in recognition of his many deeds of charity, and a full size statue of stone in a half reclining position in the main entrance hall of this hospital does honor to the memory of its founder. The hospital is for the exclusive use of the native sick poor and is maintained entirely at Government expense. The hospital is an immense one story stone building, with accommodation for 360 patients. It is an old-fashioned structure, which lacks many of the important features of a modern hospital, and it is about time that it should give way to a new building better adapted for present requirements.

Three new two story stone pavilions were opened in 1892, the Sir Dinshaw Petit Hospital for diseases of women and children, the Bai Motilalbai Maternity and the Ophthalmic Hospital, each with a capacity for about forty patients. These new buildings are modern in their construction, are well furnished and have excellent little operating rooms. The nursing is also better than in the old hospital. About 800 women are delivered annually in the Maternity Hospital, and two students attend each case, this gives them an excellent opportunity to become conversant with practical obstetrics. The most careful aseptic precautions are employed and sepsis in patients is almost unknown. The delivery room has all the austere appearances and simplicity of an operating room. Two women were in labour when I visited this department of the hospital.

Professor Dimmeck showed me a number of interesting cases on which he had recently performed major gynecologic operations. In the old building, a small ward has been converted into an operating room, supplied with the most primitive outfit for asepsis. What this hospital is sadly in need of is a new and separate operating theatre and a more complete set of surgical instruments. It is a great injustice to the surgical staff to be obliged to perform 5,000 operations annually under such trying circumstances. All hospital surgeons in India confess that it is extremely difficult to prepare a native for operation. A patient recently admitted to the surgical wards of Professor Quicke for the purpose of undergoing an operation for the radical cure of an inguinal hernia, brought with him the following sources of infection: Scabies, ringworm, diffuse furunculosis and pyorrhea alveolaris.

The nursing of this institution leaves much to be desired. The trained female nurses are inadequate in number, and it is only recently steps have been taken to organize a training school. Most of the nursing is done under their supervision by male and female ward attendants. The house staff, consisting of three medical officers of the Indian Subordinate Medical Department, is made up of a house surgeon and two assistant house surgeons. The house surgeon has charge of the property, his work being largely that of an executive officer, but, in the absence of the regular attending staff, he attends to the emergency cases, medical and surgical. The first assistant surgeon has charge of the drug room and dispensary, and the second assistant attends to the admission of patients and makes the preliminary examinations. The fourth and fifth year students do much of the dressing, under the supervision of the house surgeon and attending staff, and they assist at operations. The bedside clinics are an important feature of the clinical teaching in this, as well as in all other medical colleges in India. The attending staff of this hospital consists exclusively of the clinical teachers of Grant Medical College.

HUMAN TAILS

It may be remembered that in August, 1903, Captain B. Chatterton, F.R.C.S.I., I.M.S., published in our columns (p. 300) a brief note on the case of an infant with a tail, which had been sent in to him by Mr. Duke, the Magistrate of Gaya District. The photograph then sent was too faded for reproduction, but since then Captain Chatterton has sent us another photo which we here publish, and which admirably illustrates his case.

In this case as a reference to Captain Chatterton's article will show there was no evidence of any bone in the "tail," in fact, the tip of the coccyx could be felt just under the root of the "tail."

There are many cases of "human tails" on record, as a reference to that mine of information,

Gould and Pyle's *Anomalies and Curiosities of Medicine*, will show Traditions of tailed men are old and widespread, and there was even a belief at one time that all Cornishmen had tails



A Dutch traveller in Formosa, in the 17th century, described a wild man who had a tail more than a foot long and covered with red hair like that of a cow. So late as 1876 a Wesleyan Missionary wrote of the formal breeding of a tailed race in Kali, off the coast of New Britain. Stories exist of the tailed men of Borneo, and we know of the tradition of a tailed race of Kings in Rajputana.

But apart from such "traveller's tales" there are many cases on record where medical men have reported such. Blanchard described a tail "fully a span in length," Jacob of Dublin described a case where a pouch of skin, 6 inches long, hung down from the coccyx. It was removed and found to be thicker than the thumb, and consisted of distinctly jointed portions with synovial capsules. Gould and Pyle (*op cit*, p. 278) gave an illustration of Gosselin's case, where the tail measured 10 cm. Vichow examined a case of a tail 3 inches long amputated from a boy eight weeks old. Before the Berlin Anthropological Society were shown two adult Papuans, whose coccygeal bones projected $1\frac{1}{2}$ inch. There are numerous such cases on record, Bartel, having published, an account of 21 such cases.

A NEW PROTECTIVE INOCULATION AGAINST CHOLERA

THE Manila Laboratory has published a very interesting report by Dr. R. P. Strong, Director of the Biological Laboratory, Manila, on an experimental study of protective inoculation against cholera.

The recent severe epidemic of cholera, which caused over 90,000 deaths in Manila and its provinces, had directed the attention of the American Government to this disease.

It may be noted that while there was evidence that in many parts of the Archipelago the cholera was "certainly conveyed and spread by the water-supply," in the town of Manila itself the evidence showed that the disease was more often spread by "food infection." Dr. Strong remarks—"While cholera is not to be regarded, even in our present acceptance of the term, as a 'contagious malady,' undoubtedly in this epidemic the infection spread largely, though as a rule indirectly, it is true, from case to case. Thus it was shown how, under the conditions existing [in Manila], an individual suffering from cholera or convalescent from it might frequently infect the food of several or many other persons, and thus serve as a fine means of continuing and spreading the disease." In spite of the prompt and active measures taken by the Manila Board of Health, the disease continued its hold on the city and caused in two years the deaths of 3,866 people in the city of Manila alone.

Recognising that in an oriental city like Manila it is scarcely possible "to prevent many persons from coming in contact with and even ingesting the cholera organism," it then seemed best to "immunise artificially and to protect by vaccination against the disease as many as possible."

A few preliminary trials showed the impracticability of using Haffkine's method in those Islands, because it creates a violent reaction if effective and a violent reaction of this kind in the politically unsettled state of the country might have led to action of another kind. Moreover it is added that while Haffkine's inoculation gives rise to a bacteriocidal and agglutinative serum in the inoculated, the antitoxic value of such serum is very slight. It was therefore determined to undertake an experimental study with the object of obtaining some practicable and efficacious form of protective inoculation against the disease.

Dr. Strong then proceeds to review the previous work of experimenters in this direction, and details his own experiments.

He sums up his own conclusions as follows—

(1) By the autolytic digestion of carefully killed cholera spirilla in an aqueous fluid the receptors become separated from the bacterial cells and may be filtered off in solution.

(2) The injection of these free receptors into both man and animals furnishes a means of producing high bacteriocidal and agglutinative

blood sera. The antitoxic value of these sera is, however, moderate.

(3) The subcutaneous injection into man of such free receptors is a process which is not only free from any danger, but one which produces practically no local disturbance, and only a slight general reaction.

(4) Hence the method is a practicable one for producing a cholera immune serum in man.

(5) It is highly desirable that this cholera prophylactic be given a thoroughly practical test.

(6) It would appear hopeful that by the application to the pest bacillus of a slight modification of this method a more satisfactory prophylactic against bubonic plague could be obtained. Experiments with this end in view have already been commenced in the [Manila] Biological Laboratory.

THE Editor of "*Medical Missions in India*" states that his own "experience of Rost's Leprolin treatment of leprosy extends to eight well-marked cases of leprosy, all of whom have improved, and five of whom are apparently cured."

THE Fifteenth International Congress of Medicine will be held at Lisbon from 19th to 26th April, 1906.

WITHIN the past few weeks Dr Doyen has claimed to have found the micro-organism of "cancer," Dr DeKorte the "parasites of small-pox, vaccinia and varicella," and Dr C W Duval the protozoon of scarlet fever. It remains to be seen to what extent these announcements will be substantiated.

MR DAVID HOOPER of the Indian Museum has an interesting paper in the *Journal of the Asiatic Society of Bengal* showing that the native remedy *rusot* is the same substance as the ancient Greek lycium. It is made of an extract of barberry wood (*berberis aristata*) and is credited with many therapeutic virtues, chiefly as a febrifuge and digestant.

WE have received and shall shortly review a pamphlet on the destruction of mosquitoes by Major W M Hodder, R.E., based on the results of work done at St Lucia, West Indies.

THE next annual meeting of the British Medical Association will be held in July next at Leicester. Dr R W Boyse, of the Liverpool School, will be President of the Tropical Section, Dr Andrew Duncan, I.M.S. (*etd*), and Dr F M Sandwith will be the Vice-presidents. The Honorary Secretaries of this section will be Dr G A Clarkson, F.R.C.S. of Leicester, and Dr J M. H. Macleod, of 11, Harley Street, W.

THOSE interested in field stretchers for the removal of the sick and wounded in the field should read the article by Major T P Jones, R.A.M.C., in the December issue of the *Journal of the R.A.M.C.*

CAPTAIN SIBERRY, R.A.M.C., has published a case of guinea worm in a European soldier, who had never served in India except at Ferozepore, Attock and the Murree Hills. The disease is quite common among soldiers of the Indian Army at these stations, but we are inclined to think these sepoys generally get infected when at home on or over the Frontier.

THE report of the Septic Tank Committee was published in the *Calcutta Gazette* of 4th January, 1905. Apart from the report itself there is a lot of valuable information given in the appendices on the construction, cost, size, etc., of these septic tanks.

DR HORATIO C WOOD reports (*Therapeutic Review*, November 1904) on the value of methylene blue in malarial fevers. He says that "if not equal to quinine in power it is far superior to any other drug known." He refers to the observations of Iwanoff who maintained that while "the younger forms of the plasmodium are especially susceptible to quinine, it is the older forms which are prone to succumb to methylene blue." Wood gave methylene blue in two or three grain doses every three hours for a week or ten days and then gradually stopped it. He insists upon the continuance of the treatment for some weeks, and undoubtedly the same continuance is necessary to get the best results out of quinine. A practical point is that the patient should be warned that his urine is not unlikely to turn blue in colour.

THE *Lancet* (January 7th, 1905) contains a coloured plate to illustrate the cultivation of trypanosomata out of the Leishman-Donovan body. The article is contributed by Dr G C Chatterjee, the Assistant to Captain L Rogers, I.M.S.

THE *Lancet* in commenting upon Rogers' work on the Leishman-Donovan bodies seems to foreshadow a view that even the "malarial parasites themselves may be but a phase in the development of these "pathological occupants of the human blood." The generalisation is a great one, and of unexpected and wide significance. We await further information on this matter.

WILL contributors, who are preparing papers for the SPECIAL DYSENTERY NUMBER, please communicate the titles and contents of such to the Editor?

Reviews.

Practical Manual of Diseases of Women and Uterine Therapeutics—By H. MACNAUGHTON-JONES, M.D., M.Ch. Ninth Edition. London: Ballière, Tindall & Cox, 1904. Pp. xxxviii* 1044. Illustrations 637 and 125 coloured and plain plates. Demy 8vo. Price 21s net.

WHEN a book has passed through nine editions and become as widely and universally known as this work, it appears almost a work of supererogation to review it. The present edition however, as stated by the author in the preface, has been practically re-written and numerous additions have been made. We may say at once that it has been very much improved in many particulars, and more than maintains the high standard of its predecessors, as one of the best and most complete works on the Diseases of Women in the English language. Very special attention has been given, as in previous editions, to treatment, and these portions of the book will be found to be especially valuable and complete.

It has been brought completely and thoroughly up-to-date and there have been no notable advances up to the time of publication that we have failed to find included in it. Though, perhaps, the work has become almost too big to recommend to the average student as a textbook, it is undoubtedly one which should be studied by all those who are reading for the higher examinations in Gynaecology, and it should find a place on the shelves of the library of every practitioner, as a standard work of reference.

The general get-up of the book as to printing, binding, illustrations, plates, etc., leaves little to be desired.

Landmarks and Surface-markings of the Human Body—By I. B. RAWLINGS, M.B., B.O. (Camb.), F.R.C.S. (Eng.). H. K. Lewis, 163, Gower Street, London. Pp. viii and 76. Demy 8vo. Price 5s net.

A FAIR proportion of students consider anatomy to be a somewhat dry subject, possibly because their knowledge of disease being nil, they cannot appreciate the relative value of the facts they are then learning, perhaps, with difficulty, others may not be sufficiently interested to take the trouble to visualise a muscle they have just dissected by its surface-markings on their own bodies. Mr Rawlings has found that the "dryness" of the subject is mitigated if the importance of the surface-markings of the different structures is realised, all the most important have been fully and accurately described in this book.

The numerous illustrations are a special feature of the work; many of which have apparently been reproduced from photographs of a man on whose body the structures beneath the skin have been outlined, they are extremely good.

This book should be of use both to students dissecting and also to men going up for their "final" anxious to refresh their knowledge of anatomy. The printing, etc., is excellent.

Malignant Disease of the Larynx—By PHILIP R. W. DE SANTI, F.R.C.S. Ballière, Tindall & Cox, 8, Henrietta Street, London. Pp. 107. Crown 8vo. Price 4s.

THIS monograph fully describes malignant disease of the larynx. The section on pathological anatomy with the division into intrinsic and extrinsic varieties and their relations with the lymphatics of the organ is good.

As regards treatment the author is strongly in favour of thyrotomy in the cases seen at an early date and in others more advanced a partial laryngectomy, the mortality of a total laryngectomy being high and the condition of the patient afterwards not at all satisfactory, lists of results of different surgeons are quoted in support of this view. If good illustrations of the appearance of the disease in different stages had been added it would have improved the value of the book.

Some methods of Hypodermic Medication in the Treatment of Inoperable cancer—By J. A. SHAW-MACKENZIE, M.D. (Lond). Ballière, Tindall & Cox, 8, Henrietta Street, Covent Garden, London. Pp. 32. Demy 8vo. Price 1s net.

THE condition of patients suffering from inoperable cancer is so pitiable that any method of treatment which holds out the slightest prospect of relief is worth trying. Dr Shaw-Mackenzie has tried hypodermic injections of sodium oleate and of chian turpentine in cases of carcinoma of the tongue, of the breast, etc., combined when soap solution was used with ox-gall internally, his results described in the first part of the pamphlet were encouraging.

Mr J. H. Webb, of Melbourne, was the first to recommend sodium oleate hypodermically, and the second part of the pamphlet consists of extracts from a correspondence with Dr Shaw-Mackenzie. Mr Webb's theory of carcinoma is that—first, the lesion is a crystallization of cholesterol from the living cell produced either by injury or a local chemical change, and secondly, some change in the liver secretion, a number of his cases are detailed. The language employed in the description of the cases could have been bettered.

Current Literature

SURGERY

Appendicitis—An experience of two-thousand cases—Murphy (*Amer Jour of the Medical Sciences*, August 1904) relates his personal experience of 2,000 cases of appendicitis.

He first discusses the surgical anatomy. The proximal end at the valve of Gerlach is usually the smallest portion of the lumen, but the most severe infection and necrosis of the mucosa does not usually occur here,

but at a point about two-fifths of its length from the tip towards its base. The lumen varies enormously. He found foreign bodies in less than 2 per cent of the cases, but fecal concretions in 38 per cent, and believes that the erosion of the mucosa by these bodies produces an atrium for the admission of the infective flora into the tissue and under favourable conditions precipitates the acute attack.

As regards symptoms, they are, in the order of their occurrence, pain in the abdomen, sudden and severe, followed by nausea and vomiting, generally within three or four hours after the onset of pain, thirdly, general abdominal tenderness most marked on the right side, fourthly elevation of temperature beginning from two to twenty-four hours after the onset of pain, in severe cases reaching to 102° to 103° in eight to twelve hours. The symptoms occur almost without exception in the above order, and "*when that order varies I always question the diagnosis*." If the nausea or vomiting or fever precede the pain, the case is certainly not one of appendicitis.

Pain was a constant symptom and usually colicky in character, generally reached its acme about four hours after its onset, subsiding gradually in the majority of cases. When it subsided suddenly, as it sometimes did within the first thirty-six hours the subsidence was due either to liberation of the infective material through the neck of the appendix into the cæcum, rupture of the appendical wall or complete gangrene of the appendix. Synchronous with the cessation of pain came the diminution or cessation of absorption, "*but not necessarily a diminution or cessation of danger*," as often interpreted.

The secondary pain after the first thirty-six hours is usually of the typical inflammatory type and due to periappendical involvements, severe pain now is always a signal of great danger as it announces a beginning of peritonitis from perforation. The primary nausea and vomiting is reflex, the secondary is due to the periappendical involvement, and this is often very persistent. The abdominal sensitiveness is at first diffuse and the belly wall not particularly rigid, when the appendix becomes fully distended it is protected by a rigidity of the overlying muscles. With the subsidence of the tension the general sensitiveness disappears and becomes circumscribed to the appendix itself, if absent from the usual position, a pelvic examination will reveal it.

If the tenderness has become circumscribed and then suddenly increases with pain and vomiting, a perforation of the circumscribing adhesions and infection of the general peritoneum is indicated. Fever was not absent in a single acute infective case in the first 36 hours. In acute severe infections it is present in a few hours, in acute obstructions of the neck of the appendix with mild infection it occurs later, and in the calculous obstructions does not appear until 20 to 24 hours after the onset of pain. He will not operate if there has been no fever within the first 36 hours.

The temperature may subside within twenty-four hours, and if it do so suddenly, the cause may be gangrene of the mucosa and failure of further absorption. When it subsides gradually within 36 to 52 hours then it is due to rupture of the appendix either into the meso-appendix or to circumscribed adhesions around the organ. A remission of temperature of one to three degrees with subsequent gradual elevation means an infection of a new area of tissue. Secondary elevation of temperature should always be noted with apprehension as it indicates a fresh invasion of tissue, a thrombosis phlebitis, a peritonitis or cellular infiltration, these elevations are indications for immediate operation, and that usually means immediate drainage. A complete operation should not be attempted here, but only the focus of pus drained. He thinks that not much information can be gained from leucocytosis.

The character of the pulse has little value in the differential diagnosis of appendicitis. In the later stages of peritonitis when it becomes compressible,

rapid and feeble it is a fair index of the degree of intoxication and a guide to the prognosis rather than to the extent of the inflamed area. In the very early hours of the disease a contraction of the muscular fibres immediately overlying the appendix gives the impression that the appendix is lying immediately beneath the anterior abdominal wall when it may possibly be in the retrocecal space. In the subacute cases the appendix may be outlined, with the increase of the periappendical inflammation is a corresponding increase in size of the tumour.

The size of the tumour bears little relation to the quantity of pus. The area of infiltration around a streptococcus or staphylococcus infection is small while the area of infiltration around the colon group of bacilli is always very large in proportion to the quantity of pus.

The clinical course of the acute infective type is fairly uniform. In cases without calculus the mucosa becomes infiltrated and oedematous within an hour or two of inoculation, the oedema increases and with the aid of the pathogenic flora produces a rapid gangrene of the mucosa, submucosa and occasionally of the entire thickness of the wall and now and then complete gangrene of the appendix, so that a perforation of the appendical wall takes place in from 32 to 40 hours in virulent infections. In cases with a concretion only a small area of gangrene, usually at the site of pressure, occurs, and perforation is a little earlier in these cases.

In streptococcus infections the meso-appendix and neighbouring tissues are more seriously involved, and the area of gangrene is less than with either the colon bacillus or staphylococcus type. After 50 hours the clinical picture changes from that due to lesions of the appendix to that of infections of the periappendical regions. If the perforation occurs into the meso-appendix or under circumscribing adhesions, the clinical signs are those of a limited infection, while if into the free peritoneal cavity, those of a peritonitis more or less severe.

After a circumscribed abscess has formed, the temperature, pulse and pain subside. If a rupture into the post-peritoneal cellular tissue take place, then there is a rapid rise of temperature from absorption, if into the free peritoneal cavity a primary drop of temperature as the pus is relieved if pressure occurs. In staphylococcus infections the peritoneum becomes covered with an exudate which is later thrown off, permitting rapid absorption of septic material with rapid collapse followed by death. This sudden change occurs between the fourth and sixth days.

If the infection is streptococcal and it ruptures into the peritoneum within a few hours, all the symptoms of acute septic intoxication are present.

The colon bacillus under these circumstances may be said to produce effects midway between these two, but they vary occasionally. The quantity of pus in the dry staphylococcus type is usually small. With the streptococcus there is little, if any free pus, but the peritoneum has a peculiar dry, granulating, blistered appearance. The colon bacillus produces pus with an offensive odour, the intestines are agglutinated together and separate pockets are often formed. Collapse is not a sign of perforation but of the absorption of the products of infection from an abraded peritoneum. It will appear rapidly or slowly depending upon the virulence of the infection and the rapidity with which the endothelium of the peritoneum is destroyed. The later and grave conditions such as general suppurative peritonitis, subphrenic abscess, etc., are the sequences or direct result of "*omission*" on the part of the man who had charge of the case during the first 48 hours. The time for operative interference may be divided into four stages, first, within the first 48 hours, secondly, in the active increasing inflammation from the second to the fifth day, thirdly, in the subsiding inflammatory process from the fifth to the seventh day on, and, fourthly, in the intermediate stages between attacks. From the previous statements it can be seen that the most favourable time for operation is

within the first 48 hours of the attack. From the symptoms and clinical course of the disease it is impossible to predict with any degree of certainty what the subsequent course of the case will be.

The danger of operation in the early stage is scarcely more than that of an exploratory laparotomy. The time required for the convalescence is not more than two and a half or three weeks. Unnecessary operations as a result of error in diagnosis would be very rare. The patient would, therefore, be relieved of his appendicitis without hazard, prolonged illness or possibility of recurrence by the only timely operation. "To me there appears to be no excuse, no explanation, no logical process, no justifying hope that relieves the patient of the dangers of this disease." This is, therefore, the period of election.

As regards operation in the second stage, when the circumscribed abscess about the appendix, the active inflammatory process of the neighboring tissues or the early pathological changes of a circumscribed or general peritonitis may be present and often as well manifestations of severe intoxication, operation should be performed, but only a limited one, *i.e.*, simple opening and relief of pus tension and drainage, with removal of appendix if it be accessible.

There should be the least possible separation of adhesions. If the intoxication is not severe, even when the quantity of pus is large, circumscribed or not, the appendix is removed. Treatment after operation in these cases consists in placing the patient in a semi-sitting posture at an angle of 35°–45° for three or four days, giving large quantities of saline per rectum, four to twelve quarts in 24 hours, given slowly with the tube constantly remaining in position. No water is given by the mouth as the stomach never absorbs water and under these conditions does not readily transmit it to the intestines for absorption. Mild catharsis is induced with small doses of calomel frequently repeated, beginning eight hours after operation.

The great mortality reported in the second stage has been in a measure due to excessive manipulation, sponging, flushing and "prolonged operation."

The deaths in these cases of acute infection are due to the depression resulting from the sudden absorption of an overwhelming dose of toxin and this absorption is favoured by excessive manipulation. The sitting posture allows pus to settle where it can be pumped out by the alternating respiratory pressure. Patients being transported to hospital and also during operation are also kept in this position.

Operations in the third stage are not so urgent, the destructive process has been overpowered or the products of inflammation have emptied through ulceration into a neighbouring coil of intestine.

This process may continue for some considerable time unless some accident should rupture the wall of the abscess or the pus come in contact with some vein and cause thrombophlebitis. The pus is here an element of danger, but can be conducted to the surface, and the appendix frequently removed without hazard by carefully coffer-damming the operative field. If a mass is readily accessible in the loin, iliac fossa or pelvis, it should be opened over the most prominent point, this however is exceptional. Murphy himself opens the anterior abdominal wall and then coffer dams before opening the pus cavity.

In the fourth stage the reasons for operating are first, the proneness to recurrence, second, 60 per cent of Murphy's cases operated in the intermediate stage had had more than one attack, third, after simple incision and drainage of the abscess the disease often recurred, fourth, the flexions, adhesions, etc., following an attack also favour recurrence, fifth, these said flexions, etc., produce enough disturbance to demand an operation for their relief, sixth, recurrent attacks are as dangerous as first attacks, and seventh, the appendix can be removed in the intermediate stage without danger.

The routine incision is through the outer margin of the rectus. When the peritoneum is opened the finger

is passed down to the iliac muscles, drawn along the vessels upwards until it looks or lifts the ileum, which is then followed to the cæcum. The appendix located freed and its mesentery clamped and a catgut ligature placed in the crease. The mesentery is then divided and the base of the appendix clamped with a heavy hemostat and a catgut ligature placed in the crease. The appendix is then divided close to the ligature and embedded by two rows of linen sutures beginning at the mesoappendical line of the appendix. In cases of acute infection the stump of the appendix is not embedded. In the septic peritonitis cases the appendix is always removed and a gauze and rubber drainage tube inserted, the latter going down to the pelvis. "All the acute severely infected cases are drained, even though the appendix has not perforated."

The abdomen is closed in layers.

The immediate results if taken by hundreds have varied considerably, in the first 100 cases the mortality was 11, this was from 1889–93, after which the mortality steadily fell until the time of the meeting of the American Medical Association in 1896, when there was an outcry against the frequent operations for appendicitis, in the year after this the mortality was 7 per cent, after which there was a gradual decline when another "epidemic of so called conservatism (expectant treatment) passed over the country" – the mortality rose to 6 per cent. In the last 100 cases the mortality was 2 per cent. "We should have no deaths from appendicitis, but we are having them."

Murphy holds strong views on the obligation of the general practitioner in cases of appendicitis, admitting that 80 per cent recover and 20 per cent either die or get recurrences, if the general practitioner decides to wait it is with the understanding, "that, he is willing to sacrifice that percentage of his cases." There is no plan of treatment which controls the pathological processes or of medical treatment which materially lessens the risk.

As regards transportation of cases, if seen before the thirtieth hour, they can safely be taken to hospital, if after that, it is better to do the operation in the patient's home, whatever that home may be.

E O T

Correspondence.

MYXŒDEMA IN INDIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—You ask in your December issue about cases of myxœdema. I saw a pronounced case in a native male in 1895 in Meerut at the Cantonment Hospital. I was just mounting my horse to go off when a wretched being, as I thought in the last stage of dropsy, appeared. I told the hospital assistant to examine his urine. Next morning I enquired if there were much albumen and being told there was none suspected the methods and examined myself, but could find none. There was nothing wrong with the heart, and a glance at the man made me at once suspect myxœdema, of which I found all the signs and symptoms well marked. The man was about 40 and was absolutely dull, apathetic and flabby. The marked œdema was everywhere quite resilient. I told the hospital assistant to get the thyroid gland of a sheep or goat and give the man one half fried every day, —after some little trouble in getting the right thing this was done. Improvement set in at once, and after a month or so of treatment I saw this man swaggering into the hospital compound one morning, flourishing a stick and outpacing the people who had come with him and evidently very much pleased with himself. All look of apathy and dullness was gone. The œdema had disappeared and the man looked as brisk and answered questions as clearly and briskly as one could wish. I saw the man no more as I was ordered to Clutal the next day, and I have no doubt the man feeling so well did not trouble the Meerut Hospital again. But I should be much astonished if he did not require treatment later on elsewhere. He was a syce.

MEEAN MEER.

Yous, &c,
H HAMILTON,
Colonel, I M S.

FANCY "CURES" OF SNAKE BITE

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—*Appropos* the article in the January number, containing an account of the 'chicken cure' for snake bite, it may interest the writer to know that this cure is equally efficacious in cases of bites by non poisonous snakes, and what is more surprising, equally fatal to the chickens. The secret lies in the fact that the death of the chickens is brought about by asphyxia produced by the operator's hand.

I had an opportunity of testing this recently in my own dispensary when I found this cure in full swing one morning. The friends had brought the snake which they thought was a *Krait*. It proved to be *Gonyglophus Conesus*, but the chickens died most obligingly.

Yours, &c,

I OXLEY,

Captain, I M S

SEONI, C P

THIRTEEN CASES OF CHOLERA TREATED WITH OIL EUCALYPTUS

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In October 1904, cholera broke out in the villages surrounding Chanchal. The Mahomedans were only the victims of the fell disease. The persons who came back from the Peinya *mela* were mostly attacked and through them the disease spread in an epidemic form. The village that bore the brunt was Ramkamat, nearly half a mile south west of the dispensary. The people in general believe that the disease originates from a mysterious atmospheric phenomenon and hence they seek the aid of *Rojas*, a class of village hawajes who are versed in the mysterious art of driving the phenomenon and who have also some knowledge of drugs.

As these thirteen cases happened in the families of the estate servants (mahoots), I had the opportunity to watch them from the commencement of the attack. The patients were either children or young adults. The motions were characteristic in all the cases. In seven cases there were severe vomiting. In six cases the symptoms abated at the diarrhoea stage. In two cases uræmia supervened, of which one died, and this was the only death among these thirteen cases.

In every case I administered the oil eucalyptus with mucilage and syrup. In cases of severe vomiting I combined it with dilute hydrocyanic acid and subnitrate of bismuth. In two cases I had to apply mustard plasters on the pit of the stomach. Particular care was taken to keep the huts clean, and instructions were given for the preparation of food and drink of the patients.

Yours, &c,

CHANCHAL, MALDA

HARICHARAN BANERJI,

Medical Officer

Service Notes.

THE services of Lieutenant J Macpherson, I M S, with the Aden Boundary Commission are thus acknowledged (*Gazette of India*, January 21st, 1905). Was Medical Officer with the advanced force during the expedition against the Kotalbis. He is a hard working and skilful medical officer, and his arrangements for the care of the wounded and sick were very good.

THE designations of the Medical Store keepers have been altered somewhat as follows—Medical Store keeper, Calcutta, or Mean Mir, not as formerly, "Fengal Command" and "Punjab Command."

THE services of Captain L Gilbert, I M S, are placed permanently at the disposal of the Burma Government.

MILITARY ASSISTANT SURGEON DOWLAND has passed the examination in the Semah language.

DR. WALTER SMITH, King's Professor of Materia Medica, Trinity College Dublin, has been appointed an Examiner for the Army Medical Service Examinations.

SURGEON GENERAL W F STEVENSON, I M S, has been appointed Honorary Surgeon to the King, vice Surgeon General J Jameson, deceased.

THE following I M S officers have been put on plague duty in the Punjab—

Major S B Smith, Captain H J K Barnfield, Lieutenant R J Bradley, Lieutenant G Davys, Lieutenant W J.

Collinson, Lieutenant C L Dunn, Lieutenant P G Euston, Lieutenant F A F Brunaide, Lieutenant H Ross and Lieutenant L J M Deas.

APPLICATIONS for leave submitted to the Deputy Adjutant-General by General Officers Commanding Divisions and Brigades and Colonels on the Staff should first be forwarded to the Controller of Military Accounts for a statement of the applicants' pension service (E O Orders, 33, dated 19th January, 1905).

"THE seventeen officers of the Royal Army Medical Corps who were proposed for election as members of the Junior United Service Club, and who were black balled by a small clique a few weeks ago, were all elected at a general meeting held at the Club the end of last week. The election was an open one, and the committee, who were very indignant at the undesired snub inflicted on a splendid profession, were extremely satisfied at the result. A very strong feeling had been aroused among the Army Medical men, and there was some idea of appealing to the War Office. This, however, would have been useless. A Service Club is a private institution, over which the military authorities have no control. It is probable, however, that a new club for Army doctors will be started."

So says the *United Service Gazette*—Medical officers of Indian Army will do well to join the East India United Service Club, 16, St. James' Square.

THE services of Lieutenant A W Greig, I M S, recently Acting Superintendent, Central Prison, Farrukabad, are replaced at the disposal of the Government of India.

THE following is a translation of the Latin Oration pronounced by the Public Orator in the University of Dublin at the commencement when Major Ronald Ross was granted *honoris causa* the degree of Doctor of Science—"The serious mortality caused by those minute, yet deadly parasites, called plasmodia by scientific men, is well known, nor can any more righteous war be waged than that against those microscopic hydras which germinate in their myriads throughout our frame. In this war a most brilliant victory has been gained by Ronald Ross, a man of the most varied and striking gifts. Formerly a distinguished Major in the Indian Medical Service, he has also won success as a profound mathematician, an admirable novelist, a dramatist of no mean order, and now is one of the most eminent of Professors in Tropical Medicine. It has been supposed that malaria arose, as Lucretius says—

When soaked with drenching rains the wide earth streams,
Corruption brooding, nenth the sun's fierce beams

But, entering on a new and untried path of investigation, this great man has shown with brilliancy and certainty that the seeds of that disease are carried broadcast by mosquitoes, so that in numberless cases whomsoever those noxious creatures bite, they not merely bite, but infect with poison. And so it has come to pass that by his aid we can clearly learn in what way to avoid this most grievous malady."

REWARDS—GOOD CONDUCT AND MERITORIOUS SERVICE—With reference to India Army Order No 240 of 1904, the following Hospital Assistants, Indian Subordinate Medical Department are awarded the medal for meritorious service with an annuity of Rs 25, with effect from the 1st April 1904—

Bengal Establishment

- No 525, 1st Class Hospital Assistant Kripa Ram
- „ 502, 1st Class (now 2nd Class Senior) Hospital Assistant Shaikh Muhammad Sadik
- „ 505, 1st Class (now 2nd Class Senior) Hospital Assistant Murari Lal
- „ 490, 1st Class (now 2nd Class Senior) Hospital Assistant Abdul Ghaffar Khan
- „ 506, 1st Class (now 2nd Class Senior) Hospital Assistant Shaikh Hussain Ali
- „ 508, 1st Class (now 2nd Class Senior) Hospital Assistant Abdullah
- „ 513, 1st Class Hospital Assistant Muhammad Mashaf Ali
- „ 524, 1st Class Hospital Assistant Muhammad Mihr-din
- „ 321, 1st Class Hospital Assistant Shaikh Muhammad Yasin
- „ 386, 1st Class Hospital Assistant Shaikh Athar Hussain
- „ 399, 1st Class Hospital Assistant Shaikh Wajid Ahmad
- „ 526, 1st Class Hospital Assistant Maya Das
- „ 333, 1st Class Hospital Assistant Tara Chand
- „ 535, 1st Class Hospital Assistant Surjan Singh, *Rai Sahib*
- „ 536, 1st Class Hospital Assistant Muhammad Ismail Khan.
- „ 538, 1st Class Hospital Assistant Niaz Hussain

Bombay Establishment

- No 84, 1st Class Hospital Assistant Ittoo Chowan
- „ 99, 1st Class (now 2nd Class Senior) Hospital Assistant Shaikh Ali Shabash

No 102, 1st Class Hospital Assistant Abraham Samuel
 „ 109, 1st Class Hospital Assistant Shukh Muhammad Aziz
 112, 1st Class Hospital Assistant Rajay Khan
 MAJOR C C HUNTER I M S, 3rd Brahmins is appointed to the medical charge of 29th Gorkhas.

CAPTAIN CORRIE HUDSON I M S DRO was granted two weeks' extension of leave and on arrival in India, was posted as Medical Officer, 2nd Q O Rajputs, Calcutta.

CAPTAIN R M DAIZIES, I M S Superintendent of the Presidency Jail Calcutta, was granted one month's leave and Captain Urwin, I M S, acted for him.

In the *Journal A Mail Assor* (10th December) Dr Nicolas Sein continues his account of his medical tour in India, he writes in a very appreciative way of Jaipur and its medical institutions, he was especially struck with the admirable surgical work done in cataract and stone by Lieutenant-Colonel P Durell Park I M S, and his assistants. The rest of this article consists of a review of the literature of the Donovan bodies and concludes as follows—

“The work done in this, one of the newest fields in pathology and bacteriology by the officers of the Indian Medical Service reflects great credit on that branch of the British Colonial Service and will undoubtedly serve as a stimulant to others to blaze new pathways in the as yet but imperfectly explored wilderness of tropic diseases, tropic medicine and tropic surgery.”

CAPTAIN R HEARD, M D, I M S, Joint Civil Surgeon, Simla is appointed to the medical charge of the Army Headquarters Staff remaining in Simla during the winter.

THE special Tibet leave must be taken before end of year 1905. This special privilege leave cannot be taken in conjunction with ordinary or accumulated privilege leave or leave on medical certificate, but it may be combined with leave on private affairs, as laid down in paragraph 222 Army Regulations India, Volume II. It cancels any privilege leave due at the date special leave is taken.

THE following were appointed to be Honorary Surgeons to H E the Viceroy—

Lieutenant Colonel Lukis I M S
 Surgeon General W F Burnett Army Medical Staff
 Colonel S H Brown M D C I E Indian Medical Service
 Colonel J T B Boakey, C B, Indian Medical Service
 Lieutenant-Colonel F F Perry Indian Medical Service
 Lieutenant Colonel W G H Henderson, Indian Medical Service

CAPTAIN O M GOODBODY, I M S, took over charge of the civil medical duties at Abbottabad on 15th December 1904.

THE report of the Surgeon General of the Navy of the United States shows that considerable discontent exists among the Naval Medical Officers and that there is considerable difficulty in obtaining the services of qualified men.

It is proposed to employ female nurses in the United States Navy.

In the *Centralblatt für Chirurgie*, No 26 1904, Dr W J Van Stockum advocates the employment of balsam of Peru as a first dressing for wounds on the field of battle, his recommendation being founded on a series of experiments extending over a number of years. Facility of application and good results are the advantages claimed. Neither disinfection nor sterilisation is, as a rule, necessary, and the dressing can be left 20 days or longer without renewal. The balsam is both compressive and absorbent and in wounds of the surface any one can apply it, but in the case of penetrating wounds of narrow dimensions the aid of a surgeon is desirable, and if he should make use of a syringe to reach the inner parts it ought to be sterilised. The statistics quoted by Dr Van Stockum are entirely in favour of his contention. He finds that only 4.5 per cent of the cases of compound fracture in which balsam of Peru was employed as a first dressing were attended by suppuration whereas in cases that were treated according to the antiseptic system the percentage was 17.

THERE were “not less than” 12 commissions for the I M S to be competed for in the examination in January last, and 25 vacancies in the R A M C.

HONORARY LIEUTENANT G T MILCHEM, I S M D, Civil Surgeon of Garhwal, U P, was granted three months' privilege leave.

CAPTAIN W YOUNG I M S Civil Surgeon, Naini Tal, was granted one month's leave in January.

THE services of Captain T H Delany, I M S, are placed permanently at the disposal of Bengal.

HIS Excellency the Viceroy and Governor General has been pleased to make the following appointments on His Excellency's personal staff, with effect from the 13th December 1904—

To be Surgeon

Major A I Macnab, F R C S I M S (Bengal)

To be Honorary Assistant Surgeons

Assistant Surgeon E Mackenzie, Bombay
 Assistant Surgeon C A Lafenair, Madras
 Assistant Surgeon Nitya Lal Basak Central Provinces
 Assistant-Surgeon Maung Tha Nu A T M, Burma.
 Assistant Surgeon Atta Muhammad, Khan Bahadur, Punjab
 Assistant-Surgeon Mahendra Nath Ohldehai, Rai Bahadur, United Provinces
 Assistant-Surgeon Gopal Chunder Chatterjee, Bengal

CAPTAIN D H F COWAN, I M S, is appointed to officiate as Civil Surgeon of Kunial.

ON return from furlough combined with vacation leave Dr C C Calk resumed his appointment as Professor of Botany and Physiology, Medical College, Lahore.

MILITARY ASSISTANT SURGEON E S BAILLIE is appointed Civil Surgeon of Jhang, vice Honorary Captain W G Mason, who has been appointed Civil Surgeon of Lyallpur.

CAPTAIN S ANDERSON, I M S, has passed in Bengal by the colloquial test.

LIEUTENANT-COLONEL J H TULL WALSH, I M S, has been granted six months' special leave. It is understood that Lieutenant-Colonel Walsh will probably retire from the service.

WITH reference to Command Orders Nos 665 and 896 dated 25th August and 10th November 1904, respectively the combined leave granted to Major F W Gee, Indian Medical Service in Command Order No 623, dated 11th August 1904 is converted into ordinary leave in accordance with clause (ii) of Indian Army Order No 64, dated 1st February 1904.

CAPTAIN G FOWLER, I M S, is posted to Warda, C P, as Civil Surgeon.

CAPTAIN E J MORCAN I M S Civil Surgeon, U P, was granted two days' extension of furlough, and permitted to return to duty.

ON his return from furlough Lieutenant-Colonel C P Lukis, I M S, went to Agra, and Captain G T Birdwood, I M S, on being relieved goes to Gonda.

CAPTAIN H J WAITON, I M S, on being relieved at Gonda, went to Jhansi as Civil Surgeon.

THE *British Medical Journal* of 24th December 1904 contains a note regarding a process for the oxidation of sewage, patented by Surgeon Major Lewis Cameron, late of the Bengal Medical Service.

DR CAMERON entered the service on 31st March 1866, spent most of his service as a Civil Surgeon in Lower Bengal, where he was for many years in medical charge of Rajshahi District, and retired on 9th August 1891. The process patented, apart from the chemicals added, appears to be that used for beating up the fluid effluent from the rats, in the manufacture of indigo.

“SURGEON-MAJOR LEWIS CAMERON M D late Bengal Medical Establishment who has been interested in the article published on November 26th under the heading Biological Treatment of Sewage writes to describe a process which he has invented and, since his retirement, patented, for the oxidation of sewage and allied matters. It is as follows—

“The process consists in a tank and paddle wheel. The tank has a division down its middle, leaving a space at each end vacant equal to one-half of the width of the tank. The wheel is mounted with one end of its axle resting on one of the sides of the tank and the other end on the division.

“The sewage after coarse settling by means of lime, alum etc., is filled into the tank to a depth proportionate to the size of the tank the wheel and its paddles.

“The wheel is then set in motion at about 40 to 50 revolutions per minute. The effect is to whip up the liquid with air, and to drive it round the tank and back to the wheel again. This action goes on continuously as long as the wheel is in motion.

The result is to again and again incorporate the sewage with air till the maximum of oxidation is obtained.

The principal ingredients dissolved in sewage are derivatives of starch, albumen, salts, etc. The derivatives of starch will be oxidized into acetic acid and those of albumen into nitrous and nitric acid. These are precipitated by lime.

It is not likely that all the derivatives of albumen can be oxidized. If the liquid was not satisfactory after precipitation, it could be submitted to the action of aerobic bacteria for a month or six weeks. The liquid would then be pure enough to be disposed of in streams or on land. A very valuable manure would remain in the sludge and in the precipitate.

THE following Medical Officers in civil employ, Bengal, have passed in Bengali (colloquial test) —

Major E. Harold Browne, M.D., I.M.S.
Captain W. W. Clemesha, D.P.H., I.M.S.
Captain H. Innes, M.B., I.M.S.
Captain J. E. P. Murray, M.B., I.M.S.
Captain V. E. H. Lindesay, M.B., I.M.S.
Captain W. D. Haywood, I.M.S.

MAJOR W. R. EDWARDS, C.M.G., I.M.S. on return from leave, is posted as Residency Surgeon, Kashmir.

MAJOR H. E. DRAKE BROCKMAN, I.M.S., is posted as Agency Surgeon in Bundelkhand.

THE retirement of Lieutenant-Colonel Swaine, I.M.S., is dated from 1st November 1904 and of Lieutenant Colonel S. Borah, I.M.S., is dated from 10th September 1904.

LIEUTENANT COLONEL G. BOMFORD, M.D. C.I.E., is promoted to be Surgeon-General, *vice* Surgeon General Sir B. Franklin, K.C.I.E., vacated, dated 1st January 1905.

MILITARY ASSISTANT SURGEON C. J. FOX, I.S.M.D., was granted sixty days' leave from 20th December 1904.

THE following four Military Assistant Surgeons are placed at the disposal of Government of Bengal for civil employment from dates noted —

A. A. E. Baptist from 18th September 1904
S. J. V. Fox from 19th September 1904
H. V. Mann from 20th September 1904
A. R. Duckworth from 23rd October 1904

CAPTAIN C. H. S. LINCOLN, I.M.S., received charge of Bijapur Prison on 16th December 1904.

“OUR readers,” says the *Lancet* “may be glad to have their attention directed to an article in the *Fortnightly Review* for this month (December) on ‘The Awakening of Afghanistan,’ in which there is an interesting reference to the beneficial medico-political influence of such services as that rendered by Major Bird, M.D., F.R.S. L.M.S. by his journey to Cabul and his successful treatment of the Amir. The paper is well worth reading as a whole for it gives a good picture of the relations existing between the Amir and the Indian Government and how these may be best strengthened and developed for the mutual benefit of both.”

We are glad to record that Major Bird has received the order of C.I.E. for his services.

THE MEDICAL SERVICES IN 1904 *

THE most noteworthy events in the history of the Medical Services during the past year have been the two appointments to the office of Director General, though, as both these appointments were gazetted from 1st January 1905, they may be said rather to belong to the history of the present than of the past year. In each case the powers that be have gone a considerable distance down the list to make their selection, and in each case the officer thus specially selected for promotion has been taken from among the Lieutenant-Colonels on the “selected list,” thus superseding all the officers holding the rank of Surgeon General and Colonel, in other words, the whole of the administrative grades the men previously selected for promotion. In the R.A.M.C., Surgeon General Keogh was already holding the office of Deputy Director General, with the temporary rank of Surgeon General, and his promotion was given in three steps, to Colonel on 2nd December 1904, to Surgeon General on 3rd December 1904, and to Director General on 1st January 1905, the latter office being left vacant from 2nd December, the date of Sir William Taylor's retirement, till the end of the year. Surgeon General Bomford was promoted at one step from Lieutenant Colonel to Director General, but he had been acting in the administrative grade for nearly a year, and had already officiated as Director General. Surgeon General

Keogh attains the first position in the R.A.M.C. with less than twenty-five years' service, while Surgeon General Bomford, though not yet confirmed in the administrative grade, had over thirty years' service to his credit when promoted.

Surgeon General Keogh by his selection as Director General goes over the heads of nine Surgeon Generals, 20 Colonels, and eight Lieutenant Colonels, including at least four officers who had previously been specially promoted for good service. He had also previously gone over a number of men by a special promotion for good service in the South African War. Surgeon General Bomford similarly has gone over one Surgeon General and eight Colonels, in the Bengal Service, if Madras and Bombay are counted in,—and officers of these services are eligible for the appointment of Director-General—he has been promoted over four Surgeon Generals and fifteen Colonels.

This is not the first occasion in the history of the I.M.S. when an officer has been promoted to the highest appointment in the service from among those who had not yet attained the administrative grades. If a precedent was required for promoting an officer two steps at once, it might be found in the case of Surgeon General J. M. Cunningham, who only held the rank of Surgeon Major, with the appointment of Sanitary Commissioner with the Government of India, up to the 29th March 1880, when the office of Surgeon General with the Government of India, as the head of the Service was then called, was conferred upon him. On this occasion he superseded eleven Deputy Surgeon Generals, but five out of the eleven had originally stood junior to him in the service.

A somewhat similar case was that of Dr. Campbell Mackinnon who became Superintending Surgeon on 30th July 1858 and less than a month afterwards, on 27th August 1858, while still the junior officer in the rank, became Inspector General. In those days however, there were three Inspector Generals in the Bengal Service, and Dr. Mackinnon became the junior of the three. He retired four years later, on 6th August 1862, and never became the head of the service.

When Dr. J. M. Cunningham became Surgeon General with the Government of India, the appointment of Sanitary Commissioner with the Government of India was merged in the former, and though the head of the Service received the title of Director General from 29th March 1895, when Surgeon General Cleghorn got that post, the Sanitary Commissioner ship remained combined with the higher appointment till 5th September 1904, when the separate office of Sanitary Commissioner with the Government of India was revived, and conferred upon Lieutenant-Colonel J. W. T. Leslie, late Secretary to the Director General.

The British Army seldom sees a year without war, and 1904 has been no exception to the rule. War was going on in Somaliland when the year opened, and military operations were in force in the Aden Hinterland, while during the year we have had a small expedition in West Africa, and the Mission to Tibet. The British Empire is so wide that it is difficult to be sure, at any given time, that there is no small war going on somewhere or other, but apparently 1904 has gone out, and 1905 come in during an interval of peace, the first time for many a long year when such a thing could be said. One Medical Officer, Lieutenant Welland of the R.A.M.C., was killed in action in Somaliland on 10th January 1904 while several others have received decorations for active service in Somaliland and Tibet.

The number of deaths in the services have been fewer than usual this year, only seven in the R.A.M.C., three in Bengal (one of whom was on half pay) and one each in Madras and Bombay, while the new I.M.S., in which no less than seven deaths occurred in 1902, did not lose a single officer in 1904. The number of deaths of retired officers has also not been large, the best known being Surgeon General J. Jameson, late Director General of the R.A.M.C., and H. Cayley and John Campbell of the Bengal Service, the latter a mutiny veteran, who got the C.B. in 1858.

Two officers who passed away during the year had originally held commissions as Assistant-Surgeons in the Army Medical Department, but had left the Army for other fields long ago, Sir W. R. Kynsey and Sir D. P. Ross, late P.M.O.'s in Ceylon and British Guiana, respectively.

The oldest officer of the retired list of the I.M.S., Surgeon Francis Thompson, died on 22nd August 1904, at the age of 95. Born on 2nd November 1808, he became Assistant-Surgeon on 18th April 1833 and retired on 14th July 1856, nearly half a century ago. The oldest officers of the I.M.S. now living appear to be Surgeon Majors H. B. Hinton and A. C. Macrae who entered the service on 18th and 24th January, 1839, and retired on 7th March 1868 and 28th January 1865 respectively.

The Army List of 1st January 1905 shows 252 names in the Bengal Medical Service, 110 in Madras, and 71 in Bombay, while the new I.M.S. which is only eight years old, contains 299 names. In another two years, when it is ten years old, the new service will probably outnumber the three old ones put together, a somewhat startling proof of the relative numbers of senior and junior men in the service. There are now 77 men in Bengal with over twenty years' service, 49 in Madras, 31 in Bombay, and 206 in the R.A.M.C.

* For the following we are indebted as usual to Lt. Col. D. G. Crawford, I.M.S., of Hughli.

THE SERVICES IN 1903

I —BENGAL.

A Deaths

No	Rank	Name	Date	Remarks
1	Lt -Col	G Duncan	3rd February	Dehra Ismail Khan, pneumonia.
2	Major	G B French	20th August	Tunbridge Wells.
3	Captain	J W Wolfe	17th October 1903	England T H P from 20th May 1900
4	"	W Henvey	11th January	" " from 4th March 1902.

B Retirements

No	Rank	Name	Date	Remarks
1	Colonel	C W Cair Calthiop	2nd April	
2	"	B O'Brien	3rd December	
3	Lt 'Col	J O Fullerton	28th June	Extra pension
4	"	W A Mawson	1st "	On T H P (F P 15th Oct 1904)
5	"	G S Griffiths	1st "	Extra pension
6	"	F R Swaine	1st November	
7	"	S Borah	10th September	
8	"	W L Price	4th December	
9	Major	N P Sinha	1st June	
10	"	D G Marshall	25th September	On T H P

C Promotions

No	Old Rank	Name	New Rank	Date	Remarks
1	Lt Col	D Wilkie	Colonel	2nd April	v Cair Calthiop, R
2	"	H K McKay	"	3rd December	v O'Brien, R.

D Honours

No	Rank.	Name	Honour	Date	Remarks
1	Surgn Genl	Su Wi R Hooper	K H S	6th August	v Cayley,*D
2	D S G	J H Thornton	K C B	24th June	
3	Colonel	H Hamilton	C B	24th "	
4	"	H Hamilton	G S P	25th Oct. 1902	
5	Lt 'Col	L A Waddell	C B	16th Dec	Tibet
6	"	A M Crofts	Kt Philp*		* Order of Philp the Magnanimous,
7	Major	W H B Robinson	"		Knight's Cross, 1st Class

E Deaths of Retired Officers

No	Rank	Name	Date	Remarks
1	Surgn Col	G C Chesnaye	12th April	Bournemouth
2	Brig Surgn	H Cayley	19th March	Weybridge.
3	"	H Potter	9th October	England
4	Lt. Col	J M Zorib	2nd July	Calcutta
5	Surgn Major	J Campbell	26th August	Looe, Cornwall
6	Surgeon	F Thompson	22nd "	England

II —MADRAS

A Deaths

No	Rank	Name	Date	Remarks
1	Lt Col	E Ferrand	9th March	Peshawar

B Retirements

No	Rank	Name	Date	Remarks
1	Surgn Genl	D Sinclair	15th November	
2	Lt Col	J Lancaster	1st April	Extra pension
3	"	T H Pope	1st March	

C Promotions

No	New Rank	Name	New Rank	Date	Remarks
1	Colonel	A M Branfoot	Surgn Genl	13th January	(Retired)
2	"	A M Branfoot	Pres Md Bd	1st "	London
3	"	W R Browne	Surgn Genl	11th October	v Sinclair, T E
4	Lt 'Col	P H Benson	Colonel	"	v Browne, P

D Honours

No	Rank	Name	Honour	Date	Remarks
1	Major	R Ross	D Sc , Dubhu	1904	Honoris causa

E Deaths of Retired Officers

No	Rank	Name	Date	Remarks
1	D S G	A Sanderson	23rd May	Douglas, Isle of Man
2	"	E E Lloyd	8th April	Wokingham, Bucks
3	Surgn -Lt Col	J F FitzPatrick	5th May	Cheltenham

III —BOMBAY

A Deaths

No	Rank	Name	Date	Remarks
1	Captain	H M Moore	3rd June	Plague, Bombay

B Retirements

No	Rank	Name	Date	Remarks
1	Lt Col	W P Carson	28th January	Extra pension
2	"	K R. Kutikar	24th May	

*C Promotions—Nil**D Honours—Nil**E Deaths of Retired Officers*

No	Rank	Name	Date	Remarks
1	I G	T W Ward	19th April	England
2	S G	W Thom	11th June	London
3	Surgn-Major	J E Ferguson	11th October	Aberdeen
4	Asst Surgn	Baron G Von Liebig	— January	

*IV—I M S**D Honours*

No	Rank	Name	Honour	Date	Remarks
1	Captain	C Hudson	D S O	6th September	Somaliland
2	Lieutenant	J H Horton	D S O	"	"

*V—R A M O**A Deaths*

No.	Rank	Name	Date	Remarks
1	Colonel	R de la C Corbett	24th March	Lucknow
2	Lt. Col	J Watson	15th "	Canterbury
3	Major	J H Greenway	8th August	Wynberg, Cape Colony
4	Captain	R D Jephson	9th January	Pindi, shooting accident
5	"	H E Weston	21st February	Sialkot
6	"	H E Haymes	15th March	Bahrel Ghazal, Soudan
7	Lieutenant	G R Welland	10th January	Killed in action, Jiddah, Somaliland

B Retirements

No.	Rank	Name	Date	Remarks
1	D G	Sir W Taylor	2nd December	
2	S G	Sir W D Wilson	1st January	
3	Colonel	R Blood	13th August	
4	"	A H Anthonisz	22nd December	
5	Lt Col	J Hickman	20th January	
6	"	T Aichei	6th February	
7	"	G T Trewman	3rd August	T H P from 17th March 1905
8	"	R C K Laffan	16th April	
9	"	W L Lane	11th May	
10	"	R C Gunning	25th June	
11	"	J T Carey	25th "	
12	"	W Kenys	11th "	
13	"	E M Wilson	24th September	
14	"	H E Deane	8th October	
15	"	G T Coates	26th September	On T H P
16	"	J Maconachie	11th October	"
17	"	J R. Mallins	14th December	
18	Major	A F Tyrrell	11th February	On T H P
19	"	R E Kelly	12th March	On T H P from 6th February 1902
20	"	J W F Long	9th July	
21	"	R H Clement	3rd August	
22	"	G B Russell	3rd "	
23	"	L R Colledge	3rd "	
24	"	S Butterworth	3rd "	
25	"	A. E C Spence	21st November	
26	"	C J Holmes	16th "	
27	Captain	R M L H Cooper	13th February	
28	"	J S Walker	19th "	On T H P (F P 19th Oct 1904)
29	"	H H Norman	25th July	On T H P
30	"	W J P Adye Curran	23rd December	"
31	Lieutenant	J Waddell	11th March	"
32	"	G W Smith	23rd April	"
33	"	W B Taylor	10th August	
34	Surgeon	T Ligertwood	3rd June	From H P (Royal Hosp, Chelsea)

C Promotions

No	Old Rank	Name	New Rank	Date	Remarks
1	Colonel	W Donovan	S G	2nd December	v Taylor, R
2	Lt. Col	G S Hughes	Colonel	25th March	v Corbett, D
3	"	W W Kenny	"	1st April	On augmentation
4	"	P M Ellis	"	13th August	v Blood, R
5	"	A H Keogh	"	2nd December	v Donovan, P
6	Colonel	A H Keogh	S G	3rd "	To complete establishment

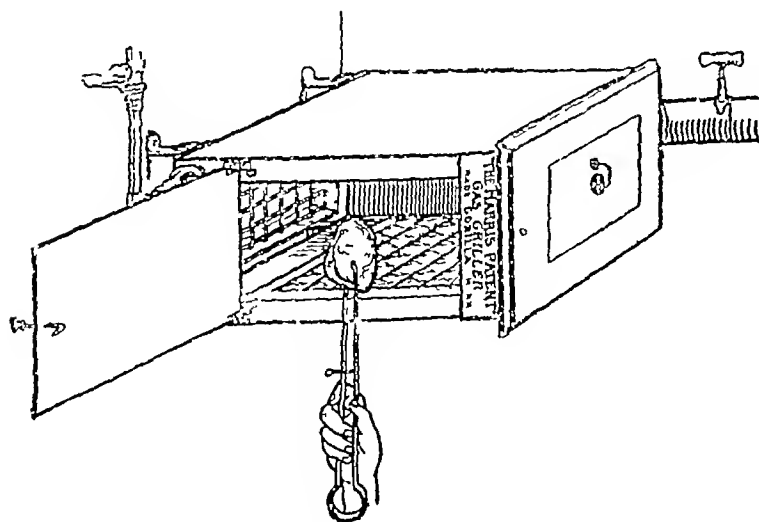
D Honours

No	Rank	Name	Honour	Date	Remarks
1	S G	E Townsend	K C B	24th June	
2	"	W J Fawcett	C B	24th "	
3	"	W F Stevenson	K H S	14th Sept	v Jameson, D
4	"	W F Burnett	G S P	— 1904	
5	S M G	T Walsh	G S P	— 1904	
6	Colonel	J F Williamson	C B	6th September	Somaliland
7	Surgeon	T Ligertwood	C B	24th June	
8	Major	A Perry	Knighted	9th November	
9	"	C Garner	Osmanich	— 1904	3rd Class
10	Captain	A E Hamerton	D S O	6th September	Somaliland
11	Asst.-Surgn	R E Bredon	K C M G	24th June	(China Customs)

E Deaths of Retired Officers				
No	Rank	Name	Date	Remarks
1	S G	J Jameson	13th September	Eltham
2		F E Scanlan	9th January	London
3	S M G	A M Tippetts	16th August	Southsea
4	D S G	J Leitoh	13th January	Edinburgh
5	"	E Menzies	25th May	Napier, New Zealand
6		W H Harris	16th February	
7	Brig -Surgn	J B Baker	4th January	London
8	"	W Ffolliott	8th June	Hove, influenza.
9	"	J H Beath	3rd September	Stirling
10	"	W Ashton	19th "	Cheltenham
11	"	E Wilson	27th "	Bray
12	B S Lt Col	F Johnson	22nd November	
13	Lt. Col	N Alcock	4th April	Ballybrack, County Dublin
14	"	J S Macadam	23rd "	Southsea
15	"	J H Whittaker	24th "	Dublin
16	"	H Stannard	2nd May	
17	"	G Ryan	7th October	Ryde
18	Surgn Maj	J Ruxton	12th August	Blackpool
19	"	H M Webb	5th October	London
20	"	H Sunter	— December	Craigellachie, Banff
21	Major	J M Bolster	19th September	
22	Surgeon	J Mubrennan	20th March	Limerick
23	"	D Hanley	3rd April	
24	Captain	J C Phipps	25th August	Strasbourg
25	Asst Surgn	Sir W R Kynsey	11th January	Horsham (late P M O, Ceylon)
26	"	W Hutchinson	23rd "	Brightlingsea
27	"	R W Woolcombe	7th March	Westbury on Tim Gloucestershire
28	"	Sir D P Ross	— June	(Late P M O, British Guiana)
29	"	C Longmore	13th July	Market Harborough

THERAPEUTIC PREPARATIONS AND SANITARY APPLIANCES

WE call attention to the Harris Patent Grill, which as a cooking stove has many points to recommend it, the chief being the great economy of gas, and the thoroughness of the cooking. It is useful both for small and large consumers, it is cheap and simple in action, there is an absence of deleterious gases and there is no smell of cooking. An ordinary steak is cooked in 5 minutes and it is claimed that 72 steaks can be perfectly grilled in one hour at the small cost of one and a quarter pence. The medical papers have spoken highly of it, and it seems to us to be well adapted to the needs of European hospitals in India. The accompanying illustration gives a good idea of what the Patent Grill is like.



CORRIGENDA

In Foby No p 53, line 3 for "only" read "entry"
 " 33 " "eminent" read "imminent"
 " 38 " "Roei" " "Roei"
 " 40 " "Oute's" " "Witte's"
 " 49 " "evening" " "evening"
 p 54, " 4 " "abnormally" " "abnormal"
 " 9 " "tracheal" " "brachial"
 " 11 " "Roei" " "Roei"
 " 39 " "bronchus" " "rhonchus"
 last line " "hr" " "the"
 2nd col., 7th last line " "go" " "go"

Notice

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BOOKS, REPORTS, &c, RECEIVED —

Thugi and Daketty Report, 1903
 Persian Gulf Report 1903-04
 Central India Report, 1903-04
 Kasauli Pasteur Institute Report, 1904
 The Report of Sanitary Commissioners, India.
 Mechanical Therapy (Grafstrom) W B Saunders & Co
 Exam of Urine, S Saxe W B Saunders & Co
 Pathological technique, 3rd Ed (Mallory and Wright)
 Materia Medica (Hatcher and Sellman) W B Saunders & Co
 A Rays (Pusey and Caldwell) W B Saunders & Co
 First Book of Pathology (McFarland) W B Saunders & Co
 Materia Medica for Nurses (Stoney) W B Saunders & Co
 Nose and Throat, 3rd Ed (Kyle) W B Saunders & Co
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 Antityphoid Inoculation (Wright) Constable & Co
 Cancer and its Treatment (Mayo Robsen) Balliere, Tindall & Cox
 Latham's Pulmonary Consumption Balliere, Tindall & Cox
 Barwell's Curvature of Spine 6th Ed Balliere Tindall & Cox
 Third Outbreak of Plague at Sydney (Ashburton Thompson)

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Original Articles.

THE OPERATION FOR THE REMOVAL OF ELEPHANTIASIS OF THE SCROTUM AND PENIS NOTES ON TWO HUNDRED CONSECUTIVE CASES

BY J. T. CALVERT,

M.B. (LOND.), MAJOR, I.M.S.,

Superintendent, Cuttack Medical School

AFTER the recent able articles on the subject in the *Indian Medical Gazette*, by Charles, Maitland and Murray it might be thought superfluous to write further about this operation. Perhaps it is, still encouraged by the hope expressed by Colonel Maitland that other officers would publish their experience, and also having regard to the fact that the statistics previously recorded refer to operations performed in the well-equipped hospitals of Presidency-towns, I have ventured to bring up my little lot performed, as they were, in a mofussil dispensary where nuisances are not, and the fal-lals of surgical millinery are only beginning to appear.

For years past a considerable number of these operations have been performed at Cuttack, the yearly average for the ten years preceding 1901 being 28. They were attended with a by no means inconsiderable mortality. In the end of 1901 certain modifications in the operation and subsequent treatment, were introduced with gratifying results, both as regards lessened mortality, shorter residence in hospital, &c. The effect of this was to greatly increase the popularity of the operation, the yearly numbers rising rapidly from 26 in 1901 to 93 in 1904.

The preliminary preparation occupying some days recommended by Charles cannot here unfortunately be carried out. There is nothing to prevent a patient leaving the hospital as he entered it through a verandah window, and a certain number do abscond during the delay caused by our brief preparations, which consist in the administration of a purge the night before and in shaving, thoroughly washing the part with soft carbolic soap, rubbing with turpentine, and applying a towel soaked in carbolic acid lotion a few hours before the operation. Practically the patients come straight from the paddy fields to the operating table, and so impatient are they of delay that occasionally the Assistant-Surgeon and myself have operated on two patients at the same time with a common dish of instruments between us.

The operation—All the various methods of operation have been tried, and even now the operation is varied somewhat to meet the case, but the routine procedure for all large tumours is as follows—

The patient, whatever the size of the tumour, is placed recumbent on the table. A large rubber

tube is placed twice round the tumour after the method of McLeod. A longitudinal incision is made from the healthy tissues above the pubes along the dorsum of the penis or over its supposed situation when invisible and the penis is rapidly dissected out, the prepuce when free being clamped with forceps and dealt with subsequently. A vertical incision is made over each testicle in turn and these when freed are turned up over the pubes. A curved incision is then made from the cut at the root of the penis to the perineum sometimes even touching the margin of the anus. A similar incision is made on the opposite side. The testicles being held well up together with the penis, a finger is placed in front of the urethra to avoid its being injured and the tumour is rapidly cut away. The cut surface is covered with towels to avoid contamination, the prepuce slit up from within, the glans thoroughly washed, and then the whole of the prepuce and all loose tissue carefully dissected off the penis. The blood vessels are clamped with forceps and twisted in adults or ligatured with catgut in the case of old men. The cord is now removed, pockets as required made beneath the skin on the inner side of each thigh into which the testicles are pushed and the skin brought together in one straight line with silver wire sutures. Before closing the wound a drainage tube is introduced from a point about three quarters of an inch above the root of the penis to the perineum where it is brought out by preference some little distance away from the anus. The suture nearest the urethra is always of strong catgut lest the penis should perchance become swollen and get cut from pressure on a metal suture. The wound being now closed, the penis is put well on the stretch, and the skin all round except in front of the urethra is fixed to its sheath by a continuous catgut suture. The penis being still kept well extended is covered with two or more skin grafts, placed longitudinally, obtained from the front and inner surface of the left thigh. These grafts are kept in position by wrapping two strips of oiled silk about an inch wide and twelve inches long round the still extended penis, followed by two long strips of bone lint wrung out of boracic acid lotion and wrapped on wet—the better to fit the penis. This dressing is kept in position by a few strips of twisted gauze tied circularly at intervals. The latter precaution is essential as it was found that when patients went to stool—bed pans are not used—the dressing used sometimes to slip off like a glove. By the above dressing the penis is incased in a fairly stiff splint and cannot retract, thus ensuring on recovery a penis of a length as great if not greater than before the onset of the disease. The wound is dressed with strips of perchloride gauze of our own preparation, sublimate wool and a figure of eight bandage. The superficial wound caused by removing the grafts is covered with a piece of lint soaked in picric acid solution 1 per cent which is

left untouched till healing has taken place under it. The wound is dressed on the fourth day and the tube removed. It is dressed again on the eighth day on which date or two days later it is usually healed. The penis is dressed on the fourth day when the oiled silk is removed and strips of gutta-percha tissue substituted. The rapidity of healing of the penis depends upon the success of the grafting. Our experience is that when two grafts are cut sufficiently broad to cover the entire penis healing is very quick and successful. With three or more grafts there is a tendency for the grafts to become displaced and healing retarded. The grafts may also be wound circularly round the penis instead of being placed longitudinally, though I prefer the latter method. Boric lint is used because it is stiffer than ordinary lint and makes a better splint. By wrapping the second piece of lint more thickly at the root than near the glans, the penis will keep erect even though unsupported as if in a splint. To protect it from injury in bed a half hoop of split bamboo is fixed over it between the side pieces of the bed. Silver wire is chiefly used on account of its cheapness as almost every bit can be used. The drainage tube is used because the wound especially before and at the time of sewing up is freely doused with perchloride lotion (1 in 1,000) which, though antiseptic, is irritating and gives rise to a certain amount of reaction.

Smaller tumours are dealt with after the manner of Charles without the elastic cord, the incision being begun below and the vessels secured as the incision is extended.

Complications—Hydroceles often of enormous size were so frequently met with as to be hardly considered a complication. They were dealt with by complete removal of the parietal tunica vaginalis. Hæmatoceles also, occasionally of huge size, were frequently met with containing great layers of fibrin and altered clot. Varicocele of the cord was frequent necessitating in some cases ligation of the veins. Hernia contrary to expectations was not frequently met with. It only occurred twice in the two hundred cases. In the first instance the hernia was double and the rupture of large size. A portion of the cæcum with the appendix being found in the right and a considerable portion of the large intestine in the left sac. A Barker's operation was performed on the left side, and subsequently a Bassini on the left with simultaneous removal of the tumour. In the second case the hernia was single and was dealt with at the time of operation on the tumour. Both cases made an uneventful recovery. Hernia would appear to be more frequently associated with the huge hydroceles so common here and which are treated practically like scrotal tumours, thus out of 25 operations I performed last year for the radical cure of hernia five were complicated with hydrocele and one with hydrocele and hæmatocele. Similar cases were also met with

amongst the operations performed for strangulated hernia during the same period.

One old man, aged 62 years, had cancer of the penis in addition to his scrotal tumour. A Pearce Gould's operation was performed in addition to the removal of the scrotum, and he made a good recovery.

In two cases impermeable stricture of the urethra was discovered on attempting to relieve retention of urine following upon the operation. They were treated by internal urethrotomy after which convalescence progressed as usual.

One patient whose urine owing to the difficulty of collecting it had not been thoroughly examined was subsequently found to be suffering from diabetes with a urine whose specific gravity was 1040 and contained an abundance of sugar. The wound healed by primary union. In two cases absence of one testicle was met with giving rise to some anxious searching at the time of operation. Removal of the testicle was only twice performed. In one case because nothing but fibrous tissue and leathery tunica could be found, in the second case on account of a suppurating hæmatocele with partial destruction of the testicle. In all other cases they were thoroughly cleaned, the tunica cut or shaved down and preserved.

Mortality

There were two deaths following the operation in the series or a mortality of one per cent. The one hundred and thirty-fifth case died of shock. The tumour was above the average in size weighing when dry 87 lbs and the patient was feeble. The one hundred and thirty-seventh case died of pneumonia. Prior to being stationed at Cuttack, I had performed this operation seventeen times successfully elsewhere. If these figures be included it would give a run of 151 cases without a death.

The average weight of the tumours removed and weighed dry, no attempt being made to estimate the fluid contents, was 105 lbs which is slightly in excess of the average recorded in Colonel Martland's series and nearly double I believe the average weight of Colonel Charles' cases. In three and a half years at Cuttack I have removed over a ton weight of scrotal tumours.

There is at present no signs of the popularity of the operation diminishing nor of any failure of the supply, as since compiling the above I have operated on a further series of 23 cases.

It is interesting to note that the patients soon discovered that no inconsiderable pain resulted from the wound from which the grafts were taken in consequence of which the better class patients brought their own "skin graft suppliers" with them. The demand thus created caused a rapid rise in the price of skin and during the "height of the operating season" as much as Rs 15 was paid for a supply of good sound skin sufficient to cover a penis.

In conclusion it should be noted that the successful results here recorded have been obtained through the assistance and from the great care and attention paid to the cases and their after-treatment by 1st Grade Assistant-Surgeon Ananda Lal Bose, Teacher of Surgery in the Cuttack Medical School. The operation itself is simple, it is due to him that it has been so free from risk.

NOTES ON THE PREVALENCE OF MALIGNANT DISEASE IN BENGAL

By J. W. D. MEGAW,

M.B., CAPTAIN, I.M.S.,

On Special Duty at the Medical College, Calcutta

The following tables have been compiled from the records of the Surgical Wards of the Medical College Hospital, Calcutta, for the past nine years, with a view to ascertaining the distribution of carcinoma and sarcoma in the various classes treated in the hospital.*

Gynaecological cases are not treated in these wards and therefore do not appear in the tables.

Only cases of primary growth and cases in which a definite diagnosis was made are included.

As a rule there was a microscopical examination of the growth, but sometimes this was impracticable, so that in a few cases the diagnosis is purely clinical.

For the sake of comparison an abstract of two other sets of cases has been prepared. One is taken from the statistics of the Madras General Hospital published by Captain Niblock, whose interesting paper will be found in the *Indian Medical Gazette* of May 1902. The other series is taken from the annual reports of St Thomas's Hospital, London, and may be regarded as representing the incidence of cancer in a large London Hospital of approximately the same scope as the Medical College Hospital of Calcutta. In considering the Calcutta statistics, it must be noted that no fair conclusion as to the relative prevalence of the affection in Europeans as contrasted with natives of India, can be arrived at, by comparing the number of admissions for malignant disease in each class, with the total number of admissions to hospital for that class.

Europeans avail themselves much more freely of hospital treatment than natives of India, and consequently, the average severity of the surgical cases among them is much less than among natives of India.

It is therefore only natural that malignant disease should bulk larger in the statistics for Natives than in those for Europeans.

[* Capt. Megaw was placed on special duty by the Inspector General of Civil Hospitals, Bengal, for the purpose of making an examination of the Medical and Surgical Records of the Medical College Hospital.—ED, I.M.G.]

In the case of Hindus and Mahomedans, the total number of admissions for each of these classes is approximately proportional to the strength of that class in the population, and it may therefore be assumed that the number of admissions for any disease constitutes a fairly reliable indication of the relative prevalence of that disease among Hindus and Mahomedans. Tables I and II deal with carcinoma.

It is noteworthy that carcinoma is more common among Hindus than among Mahomedans in the Calcutta series, there being about seven times as many cases among the former as among the latter, while the total admissions for Hindus are less than three times as many as those for Mahomedans.

The preponderance among Hindus is found in three groups of cases.

I Cancer of the Penis

Here there are 64 cases in Hindus against two in Mahomedans. This relative immunity of the Mahomedans is in accordance with the common experience, and is no doubt due to circumcision.

II Scirrhus of the Breast

There are 57 cases in Hindu females against four in Mahomedans. It may be suggested that the average Mahomedan female is more ashamed of exposing her breast for examination than the Hindu female of the same class, and therefore does not come under treatment so often, but those who are most competent to judge are by no means unanimous in accepting this suggestion, so that the question must be left open. In this connection it may be noted that Capt Niblock could not find a record of a single case of cancer of the uterus or vagina in a Mahomedan female in any of the Madras hospitals.

III Cancer of the mouth and upper alimentary tract in general

While the Hindus show an increased susceptibility in all the structures inside the mouth and pharynx, the greater incidence is specially remarkable in the case of the cheek and jaw, in which there are 49 cases among Hindus against one in Mahomedans. The fact that these parts are specially selected suggests *pan* (betel) as the influence at work, for the morsel of *pan* lies between the jaw and cheek during the greater part of the time that it remains in the mouth. The relatively great number of cases among Hindu females also points to *pan* as the cause, as it is well known that the females are more addicted to the habit of chewing *pan* than the males.

There is, however, no satisfactory evidence of any general difference in the custom of the Hindus and Mahomedans in respect of this habit, but it is probable that an accurate knowledge of the customs of the two classes would throw some light on the facts recorded.

Carcinoma of the skin is quite as common in Mahomedans as in Hindus.

With regard to carcinoma of the internal organs, the figures are too few to generalize from.

To facilitate the comparison of the relative incidence in the different parts of the body the figures have been reduced to the approximate percentages in Table II.

It must, however, be remembered that these tables are very apt to be misleading for instance, in the Madras series, cancer of the cheek, jaws, and penis, taken together, make up 72.58 per cent of the whole, while in the St Thomas's series they make up only about 8 per cent of the whole.

The result is, that in the first case, the percentage for all the other organs has to be divided among the remaining 27.5 per cent, and in the second case among a remaining 92 per cent.

It is clear that if the great excess of cases in the three parts mentioned, did not exist in the Madras series, the percentages for the other organs would be greatly increased, even though the actual figures remained the same.

The percentage tables are therefore quite misleading for the purpose of comparing the frequency of cancer of any organ in different countries, but if simply regarded as a graphic means of showing the proportion in which the different parts of the body are affected in one hospital, they are not likely to give rise to any misconception. The other means of comparing the relative prevalence of a disease in different places, is by finding the ratio between the admissions for that disease, and the admissions for all other diseases taken together, and comparing the ratios found in each place.

Here, again, there is the fallacy that the conditions existing in the hospitals are so different that no fair comparison can be based on the total admissions. As already pointed out, even in the same hospital there may be marked differences in the conditions connected with patients belonging to different classes.

The consequence is that no hospital statistics are of any value unless the local conditions are known.

In spite of the fallacies associated with the tables, there are some points which are clearly shown by them. The ratio of admissions for carcinoma to all surgical admissions among natives of India in the Calcutta series is 1 to 33, and in St Thomas's Hospital it is 1 to 18. Considering the great degree of selection of cases that is necessary in the Native Surgical Wards of the Medical College Hospital and the general unwillingness of the native to come to hospital except for some serious affection, it is probable that the actual proportion of cases of carcinoma in Calcutta is less rather than greater than is indicated by the ratio.

On the other hand, carcinoma of the internal organs is not fairly represented in the Calcutta series, as these cases are often admitted to the

medical wards and are not transferred to the surgical side unless they are operable.

The Madras series is on a different footing from the Calcutta series as it includes all the cases, both medical and surgical.

When this is taken into account, the ratio 1 to 34 for natives approaches much more nearly to the experience of the London hospital than does the Calcutta series.

The comparison of the relative frequency of the affection in different parts of the body is of some interest.

In Madras, carcinoma of the cheek and jaw is very common, making up nearly half of the total number of cases.

This prevalence is accounted for by Captain Niblock as being due to the habit of the West Coast natives of mixing a large proportion of lime with their chewing betel.

In the Calcutta series, carcinoma of the cheek and jaw is much less common than in Madras, but still it forms a considerably larger proportion of the total number of cases than it does in London.

In this connection it may be noted that the cancer statistics recently published by Captain Sutherland from the Mayo Hospital, Lahore,* do not show a large proportion of cases of carcinoma of the cheek and jaw.

It would therefore appear that Calcutta occupies an intermediate position between Lahore and Madras in respect of the prevalence of cancer of these parts.

Carcinoma of the lip is not common in any of the Indian series, probably because the native of India has adopted a method of smoking which gives rise to very little irritation of the lips.

The tongue is affected in about the same proportion in all the series.

Visceral cancer, as pointed out above, is not fairly represented in the Calcutta series, owing to the custom of treating all but the operable cases in the medical wards, but rectal cancer is probably in most cases treated as a surgical affection, and when compared with the London series, it is not at all common, either in the Calcutta records, or in the Madras records which include all the cases treated in the hospital.

Cancer of the penis appears to be about equally common in Calcutta and Madras, and is much commoner in these places than in London. Want of cleanliness is the usual explanation of the great degree of prevalence of the affection in India.

Scirrhous of the breast is not fairly represented in the Madras series, as the hospital did not admit females for the whole period covered by the records.

The Calcutta tables show that among Hindu females one case in every 22 in the surgical wards was scirrhous, while in St Thomas's Hospital the ratio for 1902 was 1 in 25.

* Vide *The Indian Medical Gazette* for November 1904.

It would appear that cancer of the breast is very common in Hindu females, though perhaps less common than the above ratio indicates.

Carcinoma of the skin is relatively much more common in the Indian hospitals than in St Thomas's. This is probably due to the scanty clothing of the Native of India being a less effective protection against external influences than the thick clothing worn in England.

The figures for rodent ulcers are too small to generalize from but such as there are tend to show that the affection is not common in natives of India.

Tables III and IV deal with sarcoma in the same way as the preceding tables deal with carcinoma, except that the comparative tables for St Thomas's Hospital show three years' cases instead of two.

It appears that the incidence of sarcoma in Hindus and Mahomedans is about equal, neither class showing any marked proclivity to the affection in any organ or group of organs. Females seem to be less affected, but the figures are too small in their case to be of much value.

As pointed out in the case of carcinoma, the figures for European and Native patients in the Calcutta Hospital cannot be used to institute comparisons.

It appears that sarcoma constitutes a larger proportion of all the surgical cases in native patients in the Calcutta hospital, than it does of the surgical cases in St Thomas's Hospital.

As already shown, it would not be safe to conclude from this, that sarcoma is correspondingly more common in Calcutta than in London, but it is clear that if the London experience is taken as the basis of comparison, sarcoma is relatively much more common than carcinoma in natives of Bengal.

The figures for Madras correspond very closely for those of Calcutta, when allowance is made for the different conditions existing in the statistics.

The figures given by Captain Sutherland for Lahore also fairly closely correspond with those for Calcutta, and on the whole it appears probable that sarcoma is a disease of uniform distribution, which is not markedly affected by race, customs or climate. Probably this uniformity is due to its being essentially an affection of the mesoblastic tissues which are not brought into direct contact with external influences to the same extent as the epiblastic and hypoblastic tissues which are attacked by carcinoma.

Taking malignant disease as a whole, the Indian experience seems to show that there is a certain amount of "inevitable cancer" which, so far as we can see, is inseparably associated with the general conditions of human existence, but that there is also a certain amount of "avoidable cancer" which is associated with local and avoidable habits and conditions. The clearest case of cancer predisposed to, or caused

by local conditions, is the Kangri Burn Cancer which appears from Dr Neve's report* to cause three times as much operable carcinoma in Kashmir, as all the other forms of carcinoma taken together.

Other instances are the epitheliomas of the cheek and jaws, due to irritant matters in the chewing betel, and the clay pipe epitheliomas of the lip, which are said to be diminishing in number in England since the claypipe has become less common. An example which is almost the converse of these is the rarity of epithelioma of the penis among Mahomedans. This is perhaps the only known instance of the artificial removal of natural conditions favourable to the development of the disease.

Table V has been appended to show the histological varieties of sarcoma which have been met with in the Pathological Laboratory of the Medical College.

It shows in tabular form all the authenticated reports on the sarcomatous tumours that have been sent for examination from the various hospitals in Calcutta and Bengal generally for the past twelve years.

The Medical College Hospital naturally contributes the vast majority of the specimens.

I am indebted to Captain L. Rogers, the Officiating Professor of Pathology at the Medical College, for his kindness in placing at my disposal the records on which Table V is based.

The structure of the carcinomata examined at the Pathological Laboratory corresponds with what is usually found in such cases and is not of special interest.

With regard to the age of the patients treated in the Medical College, the statistics for natives of India would necessarily be mere approximations, as it is quite exceptional for a native of the cultivator class to know his age.

The following examples show some of the stated ages of patients.—

(1) In cancer of the cheek the range is from 25 to 60 and the average age 46.

(2) In cancer of the tongue the range is from 23 to 62 and the average 47.

In scirrhus of the breast the range is from 30 to 60 and the average 47.

In cancer of the penis the range is from 25 to 60 with an average of 45.

In the case of sarcoma the age incidence is essentially the same in the Calcutta cases as in European countries.

The above notes were written for the purpose of annotating the statistics in the accompanying tables, which would have been misleading in some respects in the absence of comment, but any deductions that have been made from the figures are merely suggestions. Definite conclusions regarding cancer in India cannot be arrived at till a much larger number of statistics is available.

* Vide *The Indian Medical Gazette* of May, 1902.

TABLE I.

Carcinoma in the Surgical Wards of the Medical College Hospital, Calcutta, 1896—1904

	Hindus		Mahomedans		Europeans and Eurasians		Total, Native Cases, 9 years, Calcutta	Madras Native Cases, 10 years.	St. Thomas's Hospital, 2 years
	M	F	M	F	M	F			
Parotid	1			2			3		1
Cheek	17	11			2		28	323	11
Lip	11	1	1		3		13	19	21
Jaw and Gum	14	6		1	3		23	122	10
Antrum	1				1		1		5
Floor of Mouth	3				2		3	3	10
Tongue	25	3	4	2	4	2	34	64	29
Palate	1				2		1		6
Tonsil	1					2	1	1	3
Pharynx	2	1					3	4	3
Larynx	12	1	1				14	2	3
Neck	5	1	1		2	1	7	3	6
Oesophagus	2		1		2		3	3	26
Stomach							0	21	23
Intestine	2				1		2	0	35
Rectum	4	1	1		1	2	6	33	53
Liver	4						4	18	5
Pancreas	1						1		5
Kidney									3
Bladder			1		0	1	1	1	5
Other Viscera								1	2
Penis	64		2				66	201	0
Scrotum	3						3	4	2
Breast	4	57	1	4	1	16	68	44*	112
Skin of head	1						1	6	2
Trunk	7	1	1	1	2		10	3	1
Arm and Axilla	8	3	6	1			18	1	1
Leg	14	1	6	2			23	17	0
Rodent Ulcers	3	1	1	1	3		6	4	13
Total	210	88	27	14	29	24	343	898	405
Total surgical cases in same period	7,068	1,250	2,710	428	3,907	805	11,446	31,453†	7,478

* Females treated for part of the period

† Total admissions, Medical and Surgical

TABLE II

Percentage Incidence of Carcinoma

	Native Cases, Calcutta	Native Cases, Madras	St. Thomas's London
	%	%	%
Cheek	8.2	36.0	2.7
Lip	3.8	2.1	5.2
Jaws	6.7	13.6	2.5
Floor of Mouth	0.9	0.3	2.5
Tongue	9.9	7.1	7.1
Antium Palate	1.7	0.5	4.2
Tonsil and Pharynx	4.1	0.2	0.8
Larynx	2.0	0.3	1.5
Neck	0.9	0.3	6.4
Oesophagus	0.0	2.4	5.7
Stomach	0.6	0.0	8.6
Intestine	1.7	3.7	13.1
Rectum	1.7	2.2	4.9
Other Viscera	20.1	22.9	2.7
Penis and Scrotum	19.9	5.0*	27.7
Breast	15.2	3.0	1.0
Skin of Body	1.7	0.4	3.2
Rodent Ulcer	0.9	0.0	0.2
Etc			
Total	100.0	100.0	100.0

Vide note under Table I

TABLE III

Sarcoma in the Surgical Wards of the Medical College Hospital, 1896—1904

	Hindus		Mohomedans		Europeans and Eurasians		Total Natives, Calcutta	Madras * Natives	St. Thomas's Hospital
	M	F	M	F	M	F			
Orbit	3	1	3				7	12	1
Eye	1		1				2		
Face	3	1	7				11	16	1
Scalp and Skull	1						1	13	4
Parotid	3		1				4	6	4
Tongue									1
Jaws	14	1	3		1	1	18	33	7
Antrum	2		1				3		4
Tonsil								4	2
Palate	1						1		
Pharynx	1	1	3	2			7	3	5
Neck	26	3	10				39	35	9
Thyroid	1		1				2		
Breast	2	3	1	2		2	8	3†	7
Trunk Wall	11	1	3				15	22	6
Arm and Axilla	16		9		1		25	36	6
Leg	30	2	7		3		39	70	29
Pelvis	5		1				6	†	10
Testis	8		2		1		10	6	1
Liver	2						2	1	1
Kidney								4	2
Bladder	1						1	1	
Rectum	2						2		
Abdominal Cavity	2						2	12	
Etc								15	2
Total	135	13	53	4	6	3	205	292	102
Total surgical cases in same period	7,068	1,250	2,710	423	3,907	805	11,446	31,453*	7,478

* Females treated for part of the period

† Total admissions, Medical and Surgical

TABLE IV

Percentage Incidence of Sarcoma.

	Native Cases,* Calcutta. (207 cases *)	Native Cases, Madras (292 cases)	St. Thomas's, London (102 cases)
Eye and Orbit	4.3	4.1	1.0
Face	5.3	5.5	1.0
Scalp and Skull	5	4.5	3.9
Parotid	1.9	2.1	3.9
Tongue			1.0
Jaws	8.7	11.3	6.8
Antrum	1.4		3.9
Tonsil		1.4	2.0
Palate	0.5		0.0
Pharynx	3.4	1.0	4.9
Neck	18.7	12.0	8.8
Thyroid	1.0		
Breast	3.9	1.†	6.8
Trunk Wall	7.2	7.5	5.9
Arm and Axilla	12.8	12.3	5.9
Leg	18.7	24.0	28.4
Pelvis	2.9	0.0†	9.8
Testis	5.4	2.0	1.0
Abdominal Cavity	3.4	6.2	3.0
Etc	0.0	5.1	2.0

* Including two cases in Native Christians

† Females treated for part of the period

TABLE V

Cases of Sarcoma Examined Microscopically in the Pathological Laboratory of the Medical College, Calcutta

	Round Celled	Spindle Celled	Giant Celled	Lympho Sarcoma	Fibro Sarcoma	Myxo Sarcoma	Melanotic Sarcoma	Myeloid	Alveolar	Mixed Cell Sarcoma.	Sarcoma	Total
Brain	2									0	1	3
Eye		1								1		2
Orbit	2									1		3
Tongue	1											1
Jaw		2			6			2	0	1	0	11
Cheek	2	2			2				1		2	9
Antrum		1										1
Thyroid	1			1							1	3
Parotid		1			1					2		4
Pharynx	1	1										2
Neck	2	1	1	1								5
Trunk Wall	2	7	1	2		1		1				14
Testis	2	1			1	1					3	8
Breast	3	3			1	2						9
Arm	1	4	2			2	1	3			1	14
Leg	10	4	2		1	2	5		1			30
Abdominal Viscera	3	1	1	2		1					3	11
Total	32	20	7	6	12	9	6	11	2	5	11	130

GASTRO-ENTEROTOMY FOR THE RELIEF OF BENIGN STRICTURE OF THE PYLORUS —WITH REPORT OF SIX CASES

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AMONG the most miserable of men in India are those who suffer from pyloric stenosis. The six cases which form the basis of this paper are taken from a group of some twenty-six, in which operation was done on the stomach for different conditions. All of the cases of pyloric stricture occurring in the group are reported. Eight of the nine cases reported herewith were operated in the Miraj Hospital within a period of 20 months between 1900 and 1903.

CAUSATION—All of the cases were males—a significant fact since ulcer of the stomach—the most common cause of benign stricture which in Europe and America is generally believed to occur much more commonly in women than in men. The apparent discrepancy in India may be due to the fact that the majority of Indian women are strong and muscular as compared with women generally in European countries. Then, too, the fact that wasting diseases, chlorosis and nervous conditions, which are frequently the precursors of gastric ulcer, are relatively less common among native women in India than they are among the women of Western countries, may be considered an added reason for the relatively fewer cases of gastric ulcer met with among women in India.

Only one out of the nine cases gave a definite history of syphilis, though it is quite possible and even probable that others of the cases had had syphilis some time in life. Indian patients are proverbially forgetful of past events in their life and often confound their symptoms and diseases, and are seldom able to give a satisfactory and detailed account of any prolonged illness. One cannot, therefore, state the probable extent in which syphilis may have been a factor in the case reported.

HÆMATEMESIS—In the cases reported only two could recall having vomited blood or having passed blood in their stools. From the histories given hæmatemesis would appear to be much less frequent as a symptom preliminary to gastric stenosis than the standard

text-books usually assert. In India, I think one may justly assume that gastric hæmorrhage occurs more frequently than the reports of our patients would make us believe. Certainly in most of the nine cases there seemed to the writer to be little doubt as to the cause of the stenosis and of gastric ulcer having preceded the contracture. Of course, hæmatemesis does not occur in all cases of ulcer, still, that it occurs in a much larger percentage of cases than we can report in these nine cases of stenosis is well known. The point the writer would make that in India reliance should not be placed on the absence of hæmatemesis as contra indicating the presence of stricture in a given case.

Injury of the stomach through contusion appears to have been the active cause in some cases.

DIAGNOSIS—Although the diagnosis in some cases may be obscure, yet inasmuch as the symptoms on the whole are quite constant, the making of a definite diagnosis is not generally a difficult matter. It may be quite impossible to differentiate between organic and spasmodic stricture, but this is not an important consideration as the surgical treatment in both cases is practically the same. In practically all of the nine cases the diagnosis was made on the history, the symptoms and the relief or otherwise resulting from the preliminary resort to lavage and medication without respect to chemical analysis of the gastric contents.

PROMINENT SYMPTOMS—*Epigastric distress* was the principal symptom complained of by all of the patients. The pain was generally most severe under the right costal arch and was frequently reflected through to the dorsal or lumbar region, into the right flank, and occasionally to the scapular or interscapular regions.

The pain in most cases came on half-an-hour to several hours after meals and was most severe at night, usually about midnight, and continued till morning unless relieved by vomiting or by voluntary evacuation of the stomach—the patient usually passing his fingers into his throat to induce vomiting. The distress was usually described as either a burning, boring or colicky pain, or a combination of these. Several of the patients asserted that they found relief in massage of the epigastrium or flank. The writer recalls one patient who came to the hospital with a thick club about a foot long, one end of which he pressed against the epigastrium, and had

continued this practice so long that the skin was greatly thickened and endurated at point of contact with the end of the club. The relief experienced was probably due to the elevation of his stomach (which had become dilated and dislocated), thereby facilitating the emptying of it through the contracted pylorus.

Vomiting was a pretty constant symptom and in most instances was unaccompanied by some nausea. Vomiting usually afforded some degree of relief from the gastric distress and was, therefore, frequently induced mechanically by the patients themselves.

The appetite in most cases was impaired, but in none of them to any considerable extent. The patient generally said that he was afraid to eat especially at night, knowing that eating generally meant a miserable night after midnight. The character of the food taken seemed to make little difference in the degree of distress, though generally a liquid diet gave less trouble, and rice less pain than bread and vegetables.

PHYSICAL SIGNS—*Peristalsis* of the stomach was visible in about one-half of the cases. The gastric distress appeared to be severest in the cases where peristalsis was the least noticeable.

Emaciation with scaphoid abdomen—All of the patients were emaciated, most of them markedly so, and in these the belly was usually scaphoid in appearance. This condition was, of course, most marked when the stomach was empty.

Dilatation was present to some degree in all of the cases. It was greatest in those cases when peristalsis was least marked. To determine the degree of dilatation the stomach was distended either with water or air or both successively, in which case, after syphoning off the water, air was pumped in through the stomach tube by means of a Davidson enema syringe. The lower border of the stomach was found to correspond to the umbilicus or one to three inches below. Occasionally it was found punched in the direction of either flank.

The stomach contents—The amount of contraction of the pylorus could usually be determined by the quantity of undigested food returned by lavage 8 to 12 hours after a meal. The degree of subdivision of the food generally indicated the mobility of the stomach. The greater the dilatation and consequent inertia of the stomach, the coarser the food particles. One hour after a test meal consisting of eight ounces of native wheat bread and ten ounces of weak tea containing two ounces of milk, if the bread is practically all returned and is finely subdivided, stenosis was considered to be present. The return of undigested particles of food eighteen to twenty-four hours after a meal in addition to gastric distress the writer believes to be the most positive proof of the presence of a stricture. The gastric contents, several hours after a meal, were frequently bile-stained and invariably sour. Chemical analysis of the gastric contents was not made in the early cases, and although it is being made now as a matter of routine, the history and symptoms are still depended upon in positively determining the diagnosis.

The presence of a benign tumour, malignant disease of the stomach or adjacent organs might furnish the signs above referred to, but we are assuming now that the existence of those diseases has been excluded by the absence of a visible or palpable tumour.

Given a case of prolonged gastric distress which has existed from six months to several years and increasing in severity, and which is relieved by vomiting in which undigested food is returned by lavage twelve or more hours after a meal, in which there is slow emaciation without the development of a palpable tumour, cachexia, jaundice or evidence of gall bladder disease, the case failing to respond rapidly to daily lavage diet and medication, the diagnosis of a stricture may be confidently made and operation as the only possible means of relief, advised.

A history of hæmatemesia while confirmatory of the probable existence of a stricture is not essential in

making a positive diagnosis and much less so a history of syphilis.

PREPARATION OF THE PATIENT—In all cases where stricture is suspected the patients are ordered lavage of the stomach morning and evening, with four to eight pints of hot water at a temperature increasing from 105 to 115. Alkalies at intervals after meals or an acid tonic with pepsin, etc., with meals combined with suitable laxatives and a light diet are tried for a week, and in some instances for a longer period at the patient's request, and if these measures fail to give steady and marked relief operation is advised. In some cases relief is afforded by this treatment, but it is usually of only of temporary duration if a stricture is present. If the stricture is not a tight one and the symptoms are not severe relief from lavage, medication and diet may be sufficient to satisfy the patient, provided it can be uninterruptedly continued, a proposition which is possible only among those who can and will persist in the use of the stomach tube. A patient will, sometimes after a course of lavage in the hospital, return home considerably satisfied and return later demanding an operation.

Having decided on operation, the patient is prepared by a light diet for two or three days, free purgation, a cardiac tonic of strychnia and digitalis and lavage twice daily with sterile water or a weak boric acid solution. The teeth should be brushed with a mild antiseptic and the mouth rinsed several times a day with boric lotion. The abdomen and chest are prepared in the usual manner for abdominal section. Early on the morning of the operation the patient is given eight or ten ounces of broth or beef tea, and a soap and water enema given two hours later, the stomach is then washed out with weak boric lotion, and this is repeated before bringing the patient to the table. Strychnia, $\frac{1}{4}$, atropin, $\frac{1}{16}$, and morphin, $\frac{1}{4}$, are usually given half an hour before operation hypodermically. The limbs and lower abdomen and buttocks are covered with flannel and hot water bottles placed about them on the table.

The Operation—The stomach is exposed through a three to four inch median incision, beginning one inch to an inch and a-half below the ensiform cartilage. The stomach is first brought into the wound and examined, and the finger carried towards the pylorus which is palpated within the abdomen, and the region visibly examined by retraction of the wound. By invagination of the stomach wall on the end of the index finger carrying the finger into the pylorus, a reasonable estimate of the degree of contraction can be made out. If no contraction of the pylorus is made out and the colon and small intestine are contracted and appear to be reduced in calibre functional atrophy, a search for stricture in the duodenum should be made before proceeding further even if no stricture is found, and the stomach is markedly dilated with evident inertia, gastroenterotomy may be done any way if the patient's distress is such as to demand operation, even though stricture may not be actually discovered, search being made for ulcer after the stomach has been opened and failing also to discover an ulcer, gastroenterotomy may still be done if the symptoms appear severe enough to warrant it. Gastroenterotomy having been decided upon the question of choice between the anterior and posterior operation must be immediately determined. In nine cases the posterior operation was done in eight, and the anterior in one. A Murphy button was used to make the anastomosis in the anterior operation, and in one case of posterior operations. In the anterior operation (Case I) the button was removed from the stomach by gastrotomy, four months after the original operation. In the other the button had failed to pass by the time the patient had left the hospital—weeks after the operation and presumably dropped into the larger viscera—the stomach.

The posterior operation should be chosen in all cases except where the anterior wall of the stomach by dilatation or displacement appears to occupy a point

anatomically lower than the first portion of the duodenum, or where the mesenteric vessels in the mesocolon appear to be so large or so numerous that the making of an opening in it by blunt dissection is likely to be attended by troublesome hæmorrhage, in which case the anterior operation, though not anatomically so ideal, should be chosen rather than incur the risk of primary or secondary hæmorrhage. Besides, if a large vessel in the mesentery is torn and ligated, the vitality of a corresponding section of the colon may be impaired. In none of the nine cases was the condition of the mesenteric vessels such as to contra-indicate the posterior operation, but the writer has met with this condition of the mesenteric vessels in operation for simple dilatation and gastropsis.

The Von Hacker method was used in seven of the cases. Fine silk or celluloid thread and an ordinary straight round sewing needle were used. Since this method is described in nearly all of the modern textbooks on operative surgery, a description here is unnecessary. In the last two or three cases the stomach wall was stitched to the edge of the opening in the mesentery after completing the anastomosis. In all of the cases the anastomosis was performed outside of the abdominal cavity, the wound and abdomen being meanwhile protected with gauze sponges.

After examination of the stomach and replacement of it in order to find the jejunum, the colon and omentum are lifted up over the stomach, and the jejunum sought by carrying the finger along the mesocolon to the ligament of Treitz in contact with which the beginning of the jejunum is readily found. The fixidity of its proximal end establishes its identity. If the loop lying in close opposition to the right of this band (the suspensory muscle of Treitz) is brought up, it will be invariably found to be the jejunum.

Having found the loop of jejunum the anastomosis should be made at a point sufficiently distant from its fixed point to enable the afferent loop to lie in comfortable contact with the mesocolon (or stomach wall in the anterior operation) when the stomach is replaced in the abdomen. If the loop is left too long, it is likely to form a bag for the accumulation of bile and pancreatic secretion, thus encouraging the development of a "vicious circle," and if too short, it may drag upward on the stomach allowing the lowest point of the stomach wall to fall below the anastomotic opening. The employment of an additional entero-anastomosis as suggested by Weir to prevent the development of a vicious circle seems not to have been generally adopted, and has not been done by the writer. The writer now prefers the simple suture to all mechanical devices of accomplishing the anastomosis. After a little experience the anastomosis can be accomplished with little more expenditure of time than in the use of a button. The writer has completed the actual anastomosis by the Von Hacker method in ten minutes.

In eight of nine cases the abdominal wound was closed by tier sutures. The fascia at the site of the incision is normally in a state of greater tension than it is lower down, and is brought together with greater traction on the stitches. The writer has been in the habit of using for the fascia mattress sutures of fine silk and coarse chromicized catgut alternately placed. The peritoneum being sutured in the ordinary manner with a running catgut suture, and the skin with interrupted silkworm gut. In one case where haste was necessary owing to the poor condition of the patient, closure by through and through suture was done. The writer has found it best to use a small cigarette gauze drain in the lower end of the incision and which is removed in twenty-four to forty-eight hours. The wound is dressed in the ordinary manner. Rubber strapping being used to hold the gauze in place. It is very important that the binder which covers the dressing be loose about the chest so as not to restrict respiration.

In order to prevent hypostatic congestion of the lungs and bronchitis which are proved to follow operation

in these cases, the patient's chest should be elevated as soon as he has recovered from the anaesthesia, and the semisitting posture allowed as early as possible. If excessive vomiting occurs, or the epigastrium becomes distended, it is a good plan to use the stomach tube several times a day to evacuate the gas and bile stained fluid which has collected, and wash out the stomach with sterilized warm water using four to eight ounces at a time until the water returns clear.

As regards feeding the plan followed after gastro-enterotomy for any cause is practically that followed in Cases IV, V and VI, and is pretty much as follows. Every six hours nutritive enemata for first three or four days, if the bowels are loose, each enema is preceded by a dose of 15 drops of laudanum injected into the rectum 15 minutes before the enema is given, by the mouth, sterile water in drachm doses every half hour for first twenty-four hours, then after barley water in two drachm doses every hour for twenty-four hours and increased to an ounce every two hours on the third day. Chicken broth or peptonized milk may be given alternately with the barley water, and on the fourth day clear soup broths, and peptonized milk, two or three ounces every three hours may be allowed, and on the fifth day the quantity doubled at four hour intervals, or Allenbury's or Mellin's Food may be substituted or given alternately with the broth, etc. By the seventh day sago congee may be allowed, on the eighth rice, by the tenth day bread may be permitted, and thereafter ordinary food. In some cases of great weakness, essence of chicken or broth may be allowed after first twenty-four hours, a drachm at half hour intervals.

Cases

Case I—Anterior gastro-enterotomy by use of a Murphy Button. Button failing to pass was removed four months later by gastrotomy. Recovery.

Hossain, J., Mahomedan, aged 35, occupation labourer, family history negative. For two years suffered from flatulence, pyrosis, pain in the epigastrium of a dull aching character and radiating over the sternum, and occasionally through to the back and always exaggerated by eating and relieved by vomiting. No history of hæmatemesis or intestinal hæmorrhage. During the first year of his illness was treated in a State Dispensary for "liver" and dyspepsia, but without relief. Before entering the hospital he was treated in the outdoor department for upward of a year during this time, gastric stimulants, sedatives, restricted and regulated diet were all used in turn or in combination, but with only temporary relief. Emaciation continued in spite of all treatment, and the patient was finally admitted as an in-patient on the 3rd January, 1898.

Condition on admission—Strength poor, able only to walk a few steps unaided, emaciation marked, weight 98 lbs, pulse 60, good volume, anaemia very slight, tongue slightly coated with light fur, appetite poor, fears to eat on account of distress caused by food, ingestion of food always followed in from two to four hours by flatulence, eructations and pain in the epigastrium, bowels slightly constipated, chest examination negative, liver and spleen not perceptibly enlarged, epigastrium distended. Distension of stomach by air and water shows lower border one inch below umbilicus. Gastro-peristalsis visible through the abdominal wall. A test meal showed undigested particles of rice and native bread thirty hours after ingestion. The hydrochloric acid present in the washings six hours after a meal. Urine scanty, 24 ounces in 24 hours, S G 1030. No albumen or sugar.

Diagnosis—Benign stricture of pylorus.

Treatment—The patient was put on a liquid diet for some days. Lavage of the stomach was practised daily with hot water at a temperature of from 110 to 115, a gallon being used on each occasion in divided portions. Strychnine in full doses was also administered together with small doses of belladonna. At the end of eleven

days the patient's general condition was improved. His temperature ranged between 97 and 98°. Operation was now advised and gladly accepted.

Operation—Under chloroform anaesthesia, time 70 minutes, a considerable portion of this time being spent in examination of adjacent organs. A 4 inch median incision extending from within one inch of ensiform cartilage was made, and the abdominal cavity opened. The stomach (which immediately before operation had been thoroughly washed out with boric acid lotion) presented. Examination showed the vicus to be large and the lower border flabby and extending to midway between ensiform cartilage and umbilicus. The pyloric extremity was found to be hard and thickened, the thickened portion extended about two inches into the duodenum. No nodules were present, and no enlarged mesenteric glands were discovered. The colic mesentery was considerably thickened and its vessels greatly distended, due, no doubt, to the presence of the constantly loaded stomach. The stomach itself was not abnormally congested, the liver and spleen were not enlarged. A loop of small intestine was now sought for and followed up to the duodenojejunal junction, and anterior anastomosis made by means of a Murphy button. The pulse was 85 at the close of the operation and there was no shock. The patient reacted well. He was fed entirely by the rectum for the first forty eight hours, and subsequently by the stomach and rectum for two weeks, the amount of nourishment by the mouth being gradually increased. After this time nourishment per rectum was discontinued. The stitches were removed on the ninth day, the wound having healed by first intention.

On the sixteenth day, at noon, the patient was suddenly seized with an attack of acute pain referred to the umbilical region, which was followed by vomiting projectile in character. Some sixty ounces of bile stained liquid was vomited, followed by relief from the pain but resulting in marked exhaustion. The whole abdomen, which a few minutes previously was fairly distended, was now markedly scaphoid and placid. Palpation of its contents failed to reveal the site of the button. The patient was surrounded with hot water bags, a hypodermic injection of atropine given followed subsequently for twenty-four hours by strychnia and belladonna by the mouth. He reacted promptly and after feeding per rectum for twenty-four hours, nourishment by the mouth was again resumed. Twelve days later the patient had another attack very similar to the one described above but less severe, the fluid vomited on this occasion (one quart) being of a dark greenish colour.

From this the patient gained steadily. He has been entirely relieved of his gastric distress, takes his meals with relish, and at the time of dismissal, on 4th April 1898, had gained some 20 lbs in weight, and has since returned to his duties in the service of the Miraj State.

An interesting point might be raised as to the cause of the projectile vomiting on two occasions, on the 16th and 28th days after operation. It was evidently due to the development of a "vicious circle," and which was intensified as the stomach became increasingly distended with fluid, the afferent loop being drawn tightly against the stomach wall. Vomiting released the pressure on the afferent loop, and forced the anastomotic opening between the stomach and jejunum.

The button failed to pass, and after two months the patient began to suffer from localized pain in the stomach. Two months later and four months after the operation the abdomen was re-opened and a gastro-tomy done, and the button removed. Some adhesions between the stomach and abdominal wall were freed at the same time. Thereafter the patient remained free of pain whether the relief afforded was the result of the removal of the button from the stomach or the separation of the adhesions, I am unable to say. The patient six years after the operation, except for the development

of localized neuritis in the face and hands is well and able to attend to his work regularly, his stomach giving him no trouble.

Case II—Posterior gastro enterotomy by use of Murphy button. Recovery Register No 1612. Admitted 16th October, 1904. Pandurang Naryan, age 25. Maratha, residence Dongargoon, 75 miles from Miraj.

Poor general health, emaciation moderate. Heart and lungs normal, pulse 65, of fair volume, regular. Tongue clean, bowels constive, liver and spleen apparently normal.

Trouble began nine years ago and has increased steadily since. At times has periods of comparative relief. Began with vomiting blood and has spat blood at intervals of two or three months since. Complaints of pain in the right hypochondriac region and in the right flank. The pain is intermittent, is increased by food and continues several hours after a meal, and attended with flatulence. Frequently vomits his food and is relieved thereby.

The stomach distended reaches one inch below umbilicus. Lavage returns food of the previous day, fast break, all returned only partly digested, free HCl present. The urine contains a trace of albumen.

The patient has suffered so long he demanded relief by operation, and was accordingly prepared for operation.

October 20th—Operation—Chloroform narcosis. Time, one hour. Median four-inch incision.

On opening abdomen and bringing stomach into wound pyloric region found indurated and partly fixed by adhesions. Two indurated masses, each the size of a hazelnut, were made out on the posterior wall near the pylorus. No enlarged glands were discernible. The ligament of Treitz used as a guide, the jejunum was found without difficulty, and posterior gastro-enterotomy was done and the anastomosis effected with a Murphy button. An additional continuous Lambert suture was run around the line of union. There was no shock and stimulants were not required. The gauze wick drain was removed on the second day, and the stitches on the eleventh day. The wound healed by first intention except at the site of the drain where a small sinus discharging serum persisted for three weeks and finally closed.

The patient was given the following per rectum every four hours for two days. The white of two eggs, whisky and milk, each one ounce, salt 20 grains, and pepsin 5 grains. For the first forty eight hours two drachms of sterilized water was allowed by the mouth every hour and the tongue and lips frequently moistened with a wet linen sponge. On the third day one ounce of peptonized milk was allowed every four hours. On the fourth day this was increased to two ounces with three drachms of sterilized water every hour. On the fifth day the milk was increased to three ounces every four hours and the water every hour continued. On the sixth day the milk was increased to four ounces, and the quantity of water doubled. On the seventh day milk, mutton broth and conge were allowed every four hours. On the tenth day rice and milk was allowed with and this liquid continued. On the thirteenth day full diet was permitted.

No medicines were given during the first twenty-four days following the operation. He complained of some flatulence, and this was relieved by soda after his meals. He was discharged on the 37th day relieved of all his distressing symptoms complaining only of slight flatulence.

Case III—Posterior gastro enterotomy. Recovery Register No 1922—Vithu Chandra, age 40, Marathi, residence Masoli, 24 miles from Miraj. Farmer, admitted May 31st, 1901.

Patient emaciated and pale. Heart and lungs normal, liver and spleen also apparently normal, urine scanty and contains a small amount of albumen.

Patient complains of gastric distress similar to case I. Trouble begun four years ago, never vomited blood.

For three and a half years had periods of comparative relief followed by exacerbations. During the past six months distress has been constant and increasing in severity, suffer from flatulence, pyrosis and vomits after meals, food of previous day. Lavage returns, undigested food when taken twenty-four hours previously, stomach when distended reaches three inches below umbilicus.

The patient at his own request was prepared for operation, and he was put on digitalis and strychnine.

June 4th, operation—Posterior gastro enterotomy, after Von Hacker. A tight stricture of the pylorus was made out and the stomach greatly dilated. Atropin, morphin and strychnine were given hypodermically before the operation, strychnine was given during and after the operation, and continued for three days at six hour intervals. Water, as in case II, was given for two days, and rectal feeding every four hours. Barley water every three hours was allowed on the third day and continued till the sixth day when Allenbury's food one ounce every three hours was allowed in addition, this was increased to two ounces on the seventh day. Sago conje was allowed on the ninth, and full diet on the twelfth day.

Three weeks after the operation the patient's bowels became loose, the urine scanty and the face puffy. He was given an acid tonic with blue pill at bed time, and in a week these symptoms subsided. There was still a tendency to looseness of the bowel, but this was readily controlled with small doses of opium. The stitches were removed on the ninth day, the wound having healed.

Before leaving the hospital a test meal showed the stomach digestion to be normal. The urine still contained a trace of albumen, but was normal in quantity. This patient was discharged on the fifteenth day with a good appetite, enjoying his food and gaining steadily in flesh.

Case IV—Posterior gastro enterotomy Recovery Register No 1998. Admitted July 3rd, 1901. Datto Daji, age 30, male, Brahmin, clerk, residence Khatan, 100 miles from Miraj.

Good general health. Fairly well nourished. Examination of heart and lungs negative, liver and spleen normal in size. Urine contains half per cent by volume of albumen but otherwise is normal.

Admitted complaining of gastric symptoms which began a year ago with indigestion, and later vomiting of food and constipated symptoms steadily increasing in severity. No history of hæmatemesis. Complaints of distress in the epigastrium after meals, followed by flatulence and sour eructations, and by vomiting two or three hours after eating. The bowels are constipated and the tongue slightly coated.

When the stomach is distended with gas or water its lower border is two fingers breadth below the umbilicus. Lavage of the stomach contains in the morning returns most of the food taken the previous evening. H Cl is present and food is finely subdivided. For five days lavage was practised and the alkalies with bismuth and bitter acid tonics used in turn but without result. He was given strychnine and digitalis for twenty four hours and prepared for operation, the bowels being thoroughly cleaned with Epsom salts.

Operation, July 9th—Posterior gastro enterotomy as in case II. Pylorus found thickened and orifice greatly contracted, abdominal wound closed, catgut in peritoneum and through and through silk worm gut drainage, —standard dressing.

Post operative treatment—First 24 hours 3i sterilized water every hour. Enema of milk, egg and whisky every four to six hours.

Second day water increased to 5ii, and enemata continued.

Third day, water and enemata continued, and barley water ($\frac{1}{2}$ oz) every three hours.

Fourth day Allenbury's Food 5ii every three hours and water more freely, enemata continued.

Fifth day, Allenbury's Food increased to 5iii every three hours.

Sixth day, Allenbury's Food increased to 5vi every six hours.

Seventh day, continued.

Eighth day, allowed rice, milk and conje.

Eleventh day, full diet.

From the 9th day he was given a bitter tonic after meals, and this was continued till date of discharge.

He was discharged on the 20th day, relieved of his symptoms excepting a sensation of slight fulness after a meal. Free H Cl and digestion normal.

Case V—Posterior gastro enterotomy Register No 3102. Admitted February 1st, 1902. Tyappa Piraji, age 41, male, Hindu, occupation, labourer. Residence, Haroh, 12 miles from Miraj.

History and description—Patient in fair general health, nutrition poor, strength impaired, pulse 94. Heart and lungs normal. The appetite is good and the urine is normal. The tongue is pale and lightly coated. The bowels are constipated. Phist is excessive.

Present trouble began five years ago by pain in the epigastrium which at first was not constant but gradually has increased in severity and persistency. Denies the vomiting of blood or passage of blood in stools. During the past five months the pain is almost constant and is of a burning character, comes on soon after meal and increases in severity for several hours, is always worse at night. The pain is relieved by fasting and is confined to the epigastrium. Is obliged frequently to relieve himself by voluntary emesis by use of his fingers in the throat. He suffers from sour eructations but has no flatulence.

The stomach distended with air extends to the umbilicus and peristalsis is visible. Lavage after an Ewald test breakfast showed free H Cl 0.2%. Lavage in the evening after the eleven o'clock meal brings large quantities of undigested food. Rice taken in the evening is nearly all digested by the morning, a little however is returned.

After several days of treatment and the pain at night continues as before. The patient was given a laxative pill at night, and lavage and rhubarb and soda prescribed with lavage twice daily. The alkaline was changed to a bitter acid tonic with strychnine on the fifth day. The patient feels that he is but little improved and pleads to be operated on. He was given strychnine and digitalis for 24 hours and prepared in the usual way.

Operation, February 11th—Chloroform narcosis (3iss), operation 50 minutes. Usual $3\frac{1}{2}$ inch median incision. Stomach presented walls thickened and vessels very large. A small hard irregular mass could be felt at the pylorus posteriorly and the opening admitted the index finger.

Posterior gastro enterotomy by Von Hacker method. Mucous membrane of stomach friable and in evident state of chronic catarrh. The abdominal wound was closed in three layers without drainage.

Subsequent history—Feeding was conducted as in case IV. Milk and broths being allowed on third instead of Allenbury's Food. Enemata were discontinued on the third day. Sago conje was allowed on the fifth day, and rice and milk on the seventh day. Ordinary diet was permitted by the tenth day. After the thirteenth day an acid tonic was given for a few days. On the ninth day the patient suffered from colicky pains for a good part of the day, the result of an over feed of bread given by his wife surreptitiously.

Lavage was practised in the evening, and a large quantity of bile stained fluid and mucus with shreds returned.

From this on he had no pain and was discharged relieved of his symptoms on the 16th day after operation and gaining in strength and flesh.

Case VI—Posterior Gastro-enterotomy Recovery Register No 2701. Admitted July 3rd, 1902. Bhimaji, male, age 30, Hindu, occupation nil. Residence, Kerogde, 16 miles from Miraj.

Patient in fair general health, thoracic and abdominal viscera normal. The urine is normal.

Has suffered from gastric distress for a year. Several months ago was treated in the hospital by lavage, alkalies, etc., and partly relieved. His trouble has lately greatly increased in severity, and he returns seeking admission to the hospital and requests relief by operation.

The pain is of a burning drawing character and is general over the epigastrium and radiates through the both shoulders. The pain is greatly intensified by eating, and is severest several hours after meals. He sleeps but little on account of the distress after his evening meal. The pain is partly relieved by vomiting and to some extent by the expulsion of gas. Flatulence is marked and the lower border of the stomach reaches midway between the umbilicus and pubes. There is no history of syphilis or of hæmatemesis. The pain developed gradually and without known cause. The patient was purged freely and prepared for operation in the usual way, by lavage of the stomach, wet dressings, etc.

Operation, July 5th—Chloroform narcosis. Time, 50 minutes. Posterior gastro-enterotomy. The stomach was found greatly dilated, the pylorus region thickened, and its lumen greatly reduced in size. The colon was small and shrunken. The abdominal wound closed in tiers.

The subsequent feeding was the same as case V. Convalescence was smooth, the abdominal wound healing per primam, except at the site of a small stitch abscess. No medicines were given. The patient sat up on the ninth day following the operation, and was discharged on the 16th day, enjoying his food and expressing himself as greatly pleased with the relief afforded.

SOME REMARKS ON MALARIA PROPHYLAXIS

By S. H. LEE ABBOTT, M.B. (LOND.), I.M.S.,

Officiating Medical Officer, 87th Dogras

HAVING read several articles on Malaria Prophylaxis, and especially those of the Royal Society Reports to the Malaria Committee, I have been struck by the absolute absence of mention of "wind" as a very serious factor to contend with.

Observations have been made on the flight of the mosquito and the utmost distance allowed is half mile. As several observers agree to this distance according to the observations they have made, the conclusion to be drawn is that the observations were carried out in a comparatively undisturbed atmosphere.

Now in a great many cantonments where malaria is prevalent, there is generally a breeze of greater or less strength most evenings with the result that mosquitoes must be able to travel a distance far greater than half mile.

This point, I was able to satisfy myself on, in the Malakand. In the Fort there, during the malaria season in the Swat Valley, I have been able to catch anopheles in very fair numbers. Having examined the ground thoroughly on all sides, there was every reason to suppose that breeding did not take place in the near vicinity. The only conclusion to come to was, that they had come up from the rice-fields and

swamps in the Swat Valley, a distance of about three miles as the crow flies. Mosquitoes breeding in abundance I have found in multitudinous spots in this valley. It is the rarest thing for the breeze to fail at nights, and the direction is always from the valley to the Malakand.

Taking this point into consideration, how futile it seems to try and destroy larvæ with kerosene oil in a district where cultivation spreads for some distance on the windward side of the place that requires protection. The utmost that can be expected from such operations is a slight reduction in the quantities of mosquitoes, but is a reduction, only, sufficient?

Certainly not, judging by the slight reduction in the malaria incidence that took place after the operations in Mian Mu.

However, even though a slight reduction does take place, I would not have the war against larvæ to cease but continued actively in the cold weather and at such times when migration is not extensive.

Canal cuts, on the windward side of a cantonment up to two miles, or further if a strong night wind prevails, should have their sides, at the water's-edge only, so constructed that it would be possible to have the sides thoroughly cleansed periodically. Bridges over canals instead of jutting out into the stream abruptly ought to be built so that an arc of a large circle projects, consequently making it impossible for leaves to collect.

In the vicinity of barracks small cuts are made to carry away waste water from stand-pipes or their equivalents. Sometimes these cuts are made of brick-work, and are most unsatisfactory. Spirogyra, &c., grow very rapidly on the rough edges and excellent harbours for larvæ are formed. Such a cut polluted with washings from a latrine I constantly examined during one malaria season at Chakdara. Even though it was swept down everyday, yet at any time I could collect adult larvæ. Cement work is better, but only for a time, and as constructed in this country cracks appear rapidly and profusely, and the cut is then little better than if made of brick-work. Then as a rule these cuts lead to nowhere, and a swamp soon accumulates and forms an excellent breeding-ground. If this "nowhere" were so arranged that the waste water were led on to one plot of ground one day, and another the next, and so on, the defect would be remedied and a good breeding place destroyed. Instead of having one large cut, as is the rule, and which is very difficult to clean, it would be better to have two or three channels side by side having a depth of, at most, four inches and breadth of four so that when they were brushed out a thorough cleansing would take place.

Fire-buckets according to order have to be emptied and refilled once a week. Not only should they be refilled, but they should be scrubbed out as well. Vegetable growths on the bucket sides are rapid, and mere emptying will

not destroy all larvæ, many must be and are retained in the growth entanglement.

As larval destruction does not give the results that are desired, other methods have to be resorted to. I would advocate, firstly, that all barracks should have their doors, windows, and ventilators covered with fine wire-gauze. Desirable doors and windows to be so constructed that they could be opened at will. Undoubtedly, such a covering will keep a certain amount of breeze out, but I venture to think that with the lessened irritation from mosquitoes a better night's rest would be obtained.

In barracks, for British troops, where electric fans could be fitted, this mode of protection could be most easily fixed. The fans would not be interfered with, and adequate ventilation could be provided for, by means of suction and force fans. Over the force fans lattices could be arranged, thus ensuring a continuous stream of cool air being poured into the barrack.

Not only will mosquitoes be kept out but also flies, which is a very important factor in the prophylaxis of enteric. Unless the meshes of the gauze be very fine sand-flies will gain entry, but in less numbers. Can it be possible that sand-flies are a factor to contend with in malaria propagation?

If such a work be carried out by a contractor, very careful supervision will be necessary, or the gauze will be cut too small with the result that the edges will burst out and a seeming protection will be worse than a snare.

Although adequate protection can be procured during the sleeping hours, yet after nightfall, individuals can be bitten by mosquitoes when outside the protected barrack, but on the whole this is probably a minor point.

To obviate this, in barracks that are to be built in the future, let very careful attention be paid to the choosing of the sites.

If it is impossible to choose a site where no cultivation takes place for some miles to the windward side, let a site be so chosen that there are no inhabitants in the wind-swept area or if there are, have them moved to one side, and especially so in close proximity to the barracks. Then behind the barracks or the leeward side, have the quarters for followers and their children built so that if they do infect mosquitoes, these latter can be swept away by the wind and out of harm's way.

No doubt the gauze method of protecting buildings would cost a large initial outlay, yet with the results obtained in Italy and elsewhere, it certainly seems worthy of a trial, especially so when the saving in the cost of quinine is taken into consideration.

A time when many people are infected is probably during the time when during in the open air is prevalent. Bites around the ankle are frequent, but only a little care is necessary in the way of Wellington boots or putties.

My experiences of quinine prophylaxis (liquid method) point out that the results are not as good as they ought to be. The reasons I believe, are that firstly a very inadequate dose is given, and in many cases immediate vomiting is induced. Even though this form of prophylaxis does good in that should a man have an attack of fever, he will in the majority of cases remain in hospital but three days. Thus with the liquid method of quinine prophylaxis good is undoubtedly done, and good to such an extent that it is worth continuing in a military outpost where it is necessary to keep the fighting men up to strength as much as possible. In a cantonment where the fullest possible strength is not so necessary, such a method is waste of money.

With the tabloid form of administration far better results ought to be obtained.* The correct dose will be given and vomiting but very rarely produced. I was able to satisfy myself that tabloids are far superior and probably adequate from the experience I had with a wing of a regiment marching up to Tibet through the Teesta Valley last June. All men got through without an attack of malaria, and I could not trace any case afterwards that was malaria due to infection in the Teesta Valley.

Mosquito curtains as such and in the shape of gauze doors and windows seem to be the prophylaxis which will give us the best results in the near future.

CATARACT COUCHING

By H. SMITH, M.D.,

MAJOR, I.M.S.,

Civil Surgeon, Jullundur

COUCHING of the cataractous lens is probably as immemorial in the East as is the inoculation of the small-pox virus, possibly much more so, and I presume that it was introduced into Europe from the East as was the inoculation of the small-pox virus. In India at the present time there exists the caste of lens couchers—*lavals*—who travel over the country couching cataractous lenses, and I know one of them who comes to southern Europe every summer at the present time to perform this operation, and from all appearance he must be doing well from a money point of view.

We may look on couching the cataractous lens as a very retrograde proceeding, but when we find it seriously brought before the British Medical Association Meeting of 1901 by Mr. Henry Power, and an article published on it in the *Ophthalmic Review*, April, 1903, by Major Maynard, Indian Medical Service, who gives no very decided opinion as to its merits when compared with extraction, yet who leaves it to be inferred that he is on the whole an advocate

* Tablets should be available when a new and well organised Medical Store Depot and Factory is started under Government in India.—ED., I.M.G.

of the operation, such inference has been drawn, and, so far as I know, has not been challenged, considering that in Europe our opportunities for observing the results of this operation are very small indeed, it might be interesting to have the results of my observations extending over several years in the neighbourhood, which is the headquarters of the *narvals* of India, and having had charge in that neighbourhood for several years of the largest ophthalmic hospital in the world as far as cataract is concerned.

There might have been a justification for the operation fifty years ago, when making a large open wound in the eye was a serious matter, but at the present time when we can extract cataract without fear of sepsis the justification for couching with a probe puncture has passed away unless it can show better results. There is no year in which I do not see over 100 cases which have been submitted to couching. I am satisfied that the vast majority of them go bad immediately either from suppuration or iridocyclitis, and I am disposed to think more from iridocyclitis than from suppuration. A large proportion of the remainder are but imperfectly couched, a portion of the suspensory ligament being left undetached, the result being that the lens floats up on this as on a hinge to its original position behind the pupil, which causes the patient to come to hospital to have it extracted. The few cases which look perfect I can imagine being regarded as miraculous. The eye has been touched and the blind patient sees, and I have no doubt but that he sees better for a short time after the operation than a case of extraction would if the capsule be left behind. This is the class of couched lenses which is of real interest to us as if we proceed to do the operation this is the best we could aspire to attain by the operation. In this class my observation is that while the eye looks beautiful there follows a slow and steadily progressive degeneration of the vitreous and of the retina, such as we see in *retinitis pigmentosa sine pigmento*, which leaves vision in the least rapid cases very poor at four years after the operation, and a few years further on leaves no vision at all. This, in my observation, is the invariable sequence, there may be exceptions—I have not seen them—they must be few.

Assume that suppuration could be avoided by doing the operation aseptically, from the large proportion of iridocyclitis which follows, presumably from the dislocated lens acting violently as a foreign body, and the progressive degeneration of the retina which follows in the best results, presumably from the lens acting mildly as a foreign body, I am of opinion that lens couching at the present time is an operation which should not be practised outside the ranks of charlatans.

As to the operation, it is far from being a simple one. The object of the coucher is to

completely dislocate the lens and to drop it down behind the iris. A clumsy operator often ruptures the lens capsule and goes no further—with evident results. It is no easy matter to completely dislocate the lens, and in my observation the partial dislocation is more frequent than the complete dislocation in the hands of adepts in the art.

A PTERYGIUM OF BACILLI.

By R. McCARRISON, M.B.,

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THE following case presents some points of considerable interest—

The patient, a Balti cooly, came to hospital, complaining of a growth on the left eye. He gave the history of a blow from a stick on the closed eye. The growth made its appearance shortly after this accident, according to his statement it is one year old.

The situation and dimensions of the growth are clearly shown in the photograph and call for



little further description. It is seen to occupy an area of conjunctiva and cornea corresponding in size to that of a pterygium, but here its resemblance to the latter ends, the growth under description is composed entirely of bacilli. It is snow-white in colour and is raised about $\frac{1}{8}$ in above the corneal and conjunctival surfaces. The white colour of its corneal portion is very striking, and stands out very markedly against the dark-brown of the patient's iris. The conjunctival portion is by contrast less striking. Underlying the growth and conjunctiva, and at the corneo-sclerotic margin, is a dark coloured patch which looks like extravasated blood. Thus

appearance can be made out in the photograph. There is considerable vascularisation of the conjunctiva in the neighbourhood of the growth. Extending in a fan-shaped manner, and in the substance of the cornea, from the white inner margin of the growth, is a slight haze with a considerable amount of flattening of the superficial corneal layers over it. A similar haze is observed towards the inner end of the cornea's horizontal diameter, and here also the cornea presents a corresponding facet. The centre of the cornea is clear. The iris is normal and vision is not affected. There is some granular ophthalmia present.

If the growth is forcibly scraped or rubbed during the course of the application of remedies, a diffuse interstitial keratitis results. I have had an opportunity of observing this keratitis on two occasions. It was of mild type, and disappeared readily under treatment in the course of a few days.

Scrapings from the growth show that the appearance is due to the presence, in what seems to be pure growth, of an organism which closely resembles morphologically the diphtheria bacillus. When this organism was inoculated into the conjunctival sac of a puppy and scratched into the same animal's cornea, no ill effects were observed to result. I am inclined to regard the organism as the *Xerosis bacillus* found in certain conjunctival affections, whether this may be correct or not, it evidently closely resembles that organism. A point of very considerable pathological interest is the fact that this organism is evidently capable of producing a mild form of interstitial keratitis.

The only effect of treatment—that adopted is the local application of strong antiseptics—is to destroy the superficial layers of this colony of organisms. Its surface becomes oily, and the bacilli are found to have lost their staining reactions. The part of the colony on the cornea has penetrated that organ to a considerable extent, and treatment has effected little of a permanent character.

I shall be glad to send the specimens in my possession to anyone whom this communication may especially interest.

The photograph is by senior hospital assistant Kehar Singh.

A Mirror of Hospital Practice.

AN ACCOUNT OF A CASE OF COMPLETE DETACHMENT OF THE HEART FROM THE GREAT VESSELS

BY R. CHATTERTON, M.D., M.CH.,
MAJOR, I.M.S.,
Monghyr

I HAVE ventured to send in the case detailed below, in the hope that it may prove interesting. It is, I think, quite out of the common,

indeed, had I not the evidence of my own eyes and hands, and the specimens safely lodged in a bottle, I should even now, be almost inclined to doubt the possibility of what I am about to relate.

D—G, a native male, aged about 40 years, was killed somewhere on the railway, not far from Monghyr. Of the details of his death I know nothing except a statement from those who brought the body to the mortuary that he had been killed by a railway engine or carriage.

His body, as he lay on the table, looked absolutely uninjured, but on palpation I found that left side ribs numbers 2—6 inclusive had been fractured close to the sternum. I opened the body by the usual incision from the chin to the pubes. I removed the sternum in the usual way, it being of course to a large extent free on the left side. The pericardium was lacerated in front and somewhat to the left, the tear being about $1\frac{1}{2}$ inches long. On enlarging the opening in order to expose the heart the latter was found lying perfectly loose in the cavity of the pericardium.

It had been severed from all its attachments to the great vessels.

I also found a small piece of the anterior edge of the left lung lying loose on the surface of that organ. Further examination showed that there was a hole about the size of a rupee in the right side of the pericardium, and that the blood from the divided heart and great vessels had passed through this opening into the cavity of the right pleura, in which there was a considerable quantity of blood.

I give here the exact anatomical situations in which the heart was severed. The heart was contracted and empty.

(α) *Left side*—Left auricle torn across through its walls, just above the level of the mitral valve. The rent is ragged, and part of the anterior wall of the auricle remains as a long tag of tissue. Aorta torn across just above the aortic valve, tear somewhat irregular, tags remaining here and there.

(β) *Right side*—Pulmonary artery torn across through the level of the valve. Right auricle with Venæ Cavæ attachments torn right off.

I do not know if anyone has published a case of such complete detachment of the heart as this, and will conclude the account with my own idea of how it can have happened, and with a brief reference to some of the literature of such heart injuries. I happened to be performing a *post-mortem* examination shortly after this one, on a strong man, whose throat had been cut. I opened the left side ribs in a situation as nearly as possible corresponding with that in which the ribs had been fractured in the former case.

I then exerted all my force, to try and press the ribs back to the vertebral column, and although I failed to do so, yet I have little doubt that the force of two railway buffers coming in contact, one perhaps being stationary, could easily effect this. (My belief is that the

case of the heart was nipped between the broken ends of the ribs and the vertebral column) Next the pericardium was opened, and the heart being grasped, was given a half turn first in one direction and then in another, and it is surprising what a perfectly compact pedicle all the great vessels form when such a twist has been given. My opinion is, that given a sufficient force to bring the broken rib ends nearly into contact with the vertebral column, and given a very violent spasm or jerk of the body, in the sudden surprise of unexpected death from a crush between buffers, and the heart pedicle, fixed between the ribs and the vertebral column, the heart itself may have been literally wrenched off from its attachments. Short of some such explanation as this the case remains a mystery. Then, again, the small portion of lung cleanly cut off, has to be accounted for in some such way. I have looked up some of the literature in such books as I had by me. Lyon in the edition of 1890, speaking of rupture of the heart, says it "is a comparatively rare result of non-penetrating chest injuries."

He quotes Harvey as mentioning 14 cases. He adds, however, that external violence may cause rupture of an even healthy heart and yet no external marks of injury be present.

Further on he again quotes Harvey as mentioning non-penetrating chest injuries which caused rupture of the pulmonary artery, pulmonary veins, or superior vena cava. Woodman and Tidy, edn 1877, p 1143, mention that "the heart may be ruptured without any external wound." A little later they say, "wounds of the large vessels (Aorta, etc) are generally from bullets or from stabs."

Gibbons, in his work on Medical Jurisprudence, 1904, p 153, gives some very interesting cases, which he observed himself, of rupture of thoracic organs, without any external sign of injury, and without fracture of the ribs.

Dixon Mann, in his 1902 edition, also makes reference to the possibility of rupture of the heart, without penetrating wounds.

I should perhaps clearly say in conclusion that the skin in the case under report was quite uninjured in appearance.

ON HYDATIDS IN THE FEMALE PELVIS, WITH NOTES OF A CASE OF PRIMARY HYDATID DISEASE OF THE BLADDER

By R. F. STANDAGE,

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HYDATIDS in the female pelvis are of sufficiently rare occurrence to embarrass the gynaecologist who meets a case, and the case which I relate below is of interest from its rarity and also as regards its origin and its diagnosis.

We are accustomed to associate these developmental cysts of the *tænia echinococcus* with the upper abdominal zone, and in that region

especially in connection with the right lobe of the liver, they are fairly common. I have, myself, recently operated on three in that situation, and they must occur pretty frequently in the practice of every Indian surgeon. I have also removed a large hydatid cyst, containing many daughter cysts, from the orbit, but the following is the only case of pelvic hydatids which I have seen. For the notes of the case I am indebted to Mrs. Walke, the Lady Assistant in charge of the case. I did not see the woman, who was "gosha," till she was brought into the operating room.

A Mahomedan woman, aged 20, was admitted, to the Lady Curzon Hospital on November 5th, 1904, complaining of an enlarging painful lump in the lower abdomen. She stated that she had three children, all of whom were living, and the youngest of whom was $2\frac{1}{2}$ years old. She had no miscarriages, no painful periods, and her three confinements had been easy and natural. Her periods occurred quite regularly—the last was eight days before admission. For a year she had felt out of sorts, and suffered from abdominal discomfort and loss of appetite, and this increased until, six months before admission, the discomfort amounted to actual pain. About the same time she noticed two lumps, low in the abdomen, one on either side. For three months the pain had been so great that sleep, walking, or even so she said, conversation with her friends even difficult or impossible. During the last month she had complete anorexia, vomiting and obstinate constipation.

Examination—Patient was a thin, weakly woman, somewhat anæmic, and evidently in considerable pain and distress. The abdomen had the appearance of a 5 or 6 months' pregnancy, and, on palpation, a large, smooth, tense tumour was felt rising as high as the umbilicus. No contractions were felt while handling it. On percussion dullness extended higher on each side than in the middle line where it only reached half-way to the umbilicus. The flanks were resonant.

P. V.—A hard, tense tumour was found filling Douglas' pouch, and evidently connected with the uterus, which could not be differentiated from the rest of the mass. The cervix was not patulous, nor was it suggestive of pregnancy on inspection. *Per rectum*, the mass was felt to be moveable. No foetal heart sounds and no uterine souffle.

On November 10th, 1904, at the request of the woman's husband, I examined her under chloroform, on the operating table, with everything prepared for operation if necessary. With the abdominal muscles relaxed, it was easy to differentiate two very tense, round and moveable tumours, about the size of coconuts, one in each iliac fossa. The right tumour extended an inch further upwards than the left one, its upper border being an inch and a half below the level of the umbilicus. The left tumour was very freely moveable, and very hard, and, through the lax abdominal walls could be easily

grasped and slipped upwards into the flank. It was in this respect, suggestive of a floating kidney, but its origin was plainly pelvic. P. V.—a tense mass was felt filling Douglas' pouch. This was not easily differentiated from the tumour on the right, but was evidently distinct from the left one. The uterus was felt pushed forward under the pubic bone, and a sound passed the normal distance. The moveable tumour on the left was found to be connected with the uterus by an easily palpable band.

My diagnosis was a double pyosalpinx. The moveable tumour on the left side I regarded as a subserous fibroid with a long pedicle. I decided to operate at once, and, while the abdomen was being prepared, I mentioned to Dr (Miss) A. Niebel, who was kindly assisting me, that I had recently read two papers on pelvic hydatids, and that, were it not for the rarity of the condition, I would be inclined to regard this as a case of that disease.

Operation.—A median incision of 4 inches was made below the umbilicus. Directly the peritoneum was opened two small tumours, one as big as a turkey's egg, the other as a hen's egg, presented in the wound. They were immediately recognised as hydatids, and were easily removed from their very light, filamentous adhesions to the peritoneum and omentum. Two smaller tumours were found at once on passing the hand into the abdomen. They were respectively as big as a tangerine orange and a marble. They were easily removed. The large tumour in the right iliac region was now felt, and with some trouble, was delivered. It was found to have extensive adhesions to the omentum, to the appendix vermiformis and to the small intestine (ileum). The adherent omentum was ligatured across and cut away; the appendix was easily peeled off the surface of the cyst, but the small intestine was much more firmly adherent, and in spite of the greatest care in freeing it from the tumour its coats were injured. The cyst was removed from the abdomen, and the small intestine brought outside and the injured part supported by eight interrupted Lembert's sutures. The intestine having been returned to the abdomen, the very moveable tumour in the left flank, felt in the preliminary examination, was easily found and freed from its adhesions to the omentum and uterus, the adhesion to the latter forming a firm band which required ligature. These cysts cleared away the pelvis was explored, and two more cysts were discovered, one occupying the iliac fossa behind the left broad ligament, the other filling Douglas' pouch and extending outwards behind the right broad ligament. I attacked that behind the left broad ligament first, and with care broke down the adhesions attaching it to the back of the broad ligament and to the pelvic fossa. Unfortunately while at work on these adhesions, the patient strongly contracted her abdominal muscles. Before I could

remove my hand the ectocyst had ruptured, and the fluid contents were discharged into the pelvis. Luckily there were no daughter cysts, and the endocyst was removed entire. The pelvis was energetically irrigated, and as much of the ectocyst as possible was cut away. I now examined the eighth cyst occupying Douglas' pouch and the right lower iliac fossa. The adhesions to the rectum and to the back of the uterus were very firm, and, as the patient had been under the anæsthetic an hour, I decided to close the abdomen and deal with this last cyst through the vagina. I examined the ovaries and Fallopian tubes. They were healthy on each side, but part of the right mesosalpinx was adherent to the subjacent cyst. A detailed examination of the rest of the abdominal cavity was made by both myself and my assistant for further cysts, the liver, kidneys and spleen being explored. No other cyst was discovered, but on examining the bladder, the upper surface was seen to be greatly thickened and much corrugated. I had never seen a similar condition, so I directed a nurse to pass a catheter into the bladder to enable me to determine the relation of this thickening to the bladder wall. It was then found that this thickened, wrinkled membrane enclosed a small cavity distinct from the cavity of the bladder, but covered by the peritoneal coat of that organ. It was undoubtedly the shrivelled ectocyst of a hydatid which had ruptured some time previously.

The abdomen was closed in the usual three layers, the buried sutures being of Kangaroo tendon. The patient was then quickly put into the lithotomy position, the vagina sterilized and a Martin's trocar pushed into the tumour in Douglas's pouch releasing about $1\frac{1}{2}$ pints of clear fluid. The wound was enlarged, a Budin's glass catheter introduced into the cyst, and the endocyst washed out, a packing of iodoform gauze was left in the cavity, and the patient sent back to bed. Dr. Ada Niebel ably assisted me throughout the operation, for which Mrs. Walke administered chloroform most carefully. The operation lasted one hour and twenty minutes. The cysts removed were typical hydatids, consisting of a tough fibrous ectocyst, and a thick, white, gelatinous endocyst. Only one of the smaller cysts contained daughter cysts, and in the fluid of this one brood capsules and hooklets were found. The largest of the six cysts removed measured $5\frac{3}{4} \times 4\frac{1}{2} \times 3\frac{3}{4}$ inches, but I fancy that the cyst drained through the vagina was still larger.

The convalescence was practically uneventful. Skin sutures were removed on the 14th day after operation. The vaginal wound closed by the 16th day, and she was discharged on the 25th day after operation quite well and free from pain.

So many authentic cases of primary hydatids of the pelvic cavity have been recorded, that Lawson Tait's dictum, that pelvic hydatids are always secondary to, or consequent on the

rupture of hydatid vesicles in another abdominal organ—usually the liver—may be said to be disproved. In the case related above a most careful exploration of the abdominal cavity revealed no other cyst, and indeed, the history of the case confined the disease from its commencement to the pelvis. I regard this case as one of primary hydatid disease of the bladder wall, and I take the shrunken, thick membrane found over the bladder to be the remains of the wall of the original cyst. My reason for this opinion is that the shrunken, empty cyst was the only one which could be said to be implanted under the peritoneum, and that the habit of the young ovum is to burrow beneath the peritoneum prior to its development into a cyst. None of the other cysts had a peritoneal investment. But for adhesions they were free in the peritoneal cavity. The bladder cyst probably ruptured during the last pregnancy or labour, and its daughter cysts developed in the surrounding pelvic peritoneum. Whether this is the true explanation of the condition found or not, the condition is a rare one, and I have referred to such literature as I have at my command for previous cases.

In the *Journal of Obstetrics and Gynaecology of the British Empire* for July 1904, two interesting papers appeared dealing with this subject. The first (T. W. Eden) described a case of primary hydatid disease of the Fallopian tube wall. The second was an account of a case of multiple abdominal hydatid cysts involving both ovaries and the right broad ligament. The latter was by Cullingworth and Clutton, but it was, of course, impossible for them to say that the pelvic organs were primarily attacked, as the liver was extensively diseased as also the omentum and mesentery. To the former paper I am indebted for much of the following information on this very interesting subject.

Three collections of recorded cases of pelvic hydatids have been made. Villard, in 1878, collected twelve cases published since 1817, and Freund (*Gynäkologische Klinik*, 1885) in 1885 published eighteen further cases of his own. Again, Doléris (*La Gynécologie*, 1896) collected and recorded 70 cases, including Villard's and Freund's.

These records discuss the subject of primary pelvic hydatids generally, without reference to the site of primary lodgment of the ovum or ova. I can find no record in the gynaecological works at my disposal of primary hydatids of the bladder, nor is there any mention of the disease in that locality in the surgical works which I have consulted. It is evidently a rare situation for primary hydatid lodgment, as rare, perhaps as the ovary or Fallopian tube.

Bland-Sutton in his text-book on 'Tumours' states that no case of primary hydatid disease of the ovary has been recorded, and only one case of the Fallopian tube, but in Veit's "*Handbuch der Gynäkologie*" one case of primary

ovarian echinococcus cyst is mentioned, and is accredited to Péan who recorded it in 1895. In Allbutt and Playfair's "*System of Gynaecology*" Griffith states that "there is grave doubt whether any of the cases so recorded are really hydatids of the ovary." Eden in the paper quoted above gives short accounts of one other case of a primary Fallopian tube cyst (Doléris in 1896) besides his own, and of one undoubted case of hydatid disease of the ovary (Péan, 1888).

De Vries of Amsterdam has recently published a paper on primary *uterine* hydatids. He describes a case of his own, and mentions seven others which he claims to have found in continental medical literature. Schatz has collected 66 cases of echinococcus disease in the female pelvic organs. He gives the site of lodgment as follows—14 in uterus, 14 at the pelvic brim, 10 in Douglas' pouch, 7 in ovary, 7 in broad ligament, 7 in pelvic connective tissue, 5 between rectum vagina and 2 between the bladder and vagina. His collection is interesting though somewhat at variance with the records quoted above, and it is not stated whether the cysts were merely adherent to the organs to which they are credited, or were a true implantation of the ovum in the organ, in its wall or under its peritoneal investment. The latter condition alone I would regard as good evidence of primary disease of an organ. In the case I have described the shrunken bladder cyst was the only one which fulfilled this condition, the others were evidently scattered in the surrounding pelvic peritoneum as the result of its rupture.

It is difficult to trace the origin of the disease in this case. The Mahomedan aversion to dogs would, of course, make it highly improbable that she was ever brought into close contact with one. The ova must have been taken in with raw vegetables or other food, the contamination of which, while growing, or by the bazaar dust, is far from unlikely in this land of numberless pariah dogs. The woman's husband was a butcher, which, by an interesting coincidence, was also the occupation of the husband of Doléris's patient who had hydatid disease of the Fallopian tube.

MEDICAL CASES *

BY C. H. L. MEYER,
MAJOR, I. M. S.,
Bombay

Case 1 Syphilis—? Myelitis and Peripheral Neuritis—Glycosuria. This man, a Mussulman, aged 30 years, you will observe, walks unsteadily and with difficulty, the left leg seeming the weaker of the two, and the manner in which he lifts this leg has the characteristics of a "step-page" gait. On further examination both legs were found to be parietic, the paresis being most marked in the left. The tone of the muscles of the lower extremities is normal and there is no

* Paper read at Bombay Medical and Physical Society

rigidity. The knee jerks are increased on both sides, especially so on the left. Ankle clonus can just be elicited on the left side. The Babinski reflex is absent on both sides. The plantar reflexes are both present. The Cremasteric reflex is present, the left is absent. The abdominal reflexes cannot be obtained. The epigastric reflexes are present. As regards sensation there is a distinct patch of anaesthesia over the lower third of the inner surface of the left tibia. Heat sensations are defective, but all other sensations normal. The patient has the following subjective sensations, *viz*, a sense of constriction around the body just above the umbilicus and burning sensations in the soles of the feet, particularly marked in the left foot. The calf and thigh muscles are tender to pressure, as are also the peroneal nerves. He further complains of tingling sensations in the distribution of the right ulnar nerve, which seems to be slightly thickened and is decidedly tender on pressure. Beyond this there are no abnormal signs or symptoms in the upper extremities. The patient is tender on pressure and on being thumped over the region of the lower dorsal spine. There is some slight want of control over the anal and vesical sphincters. There is no wasting of any muscles, nor has the nutrition of any structures in the lower limbs suffered in any way. The pupillary reflexes are normal, and the optic discs show no change. The history of the case is as follows—Six months ago he slept out on the ground one night and got wet through. Next day he was unable to walk and suffered from severe pains in his body and limbs. Three months ago he began to walk a little. Two months ago he was admitted into the J J Hospital in the condition described at length above. A very remarkable feature in this case is that three weeks before the present date he suddenly began to pass very large amount of pale urine, and the quantity has gone on increasing since then. On examination of the urine its Sp Gr was found to be 1,040, and it contained a large amount of glucose (30 grs to the oz). There was no sugar in the urine on admission. The man suffers from great thirst, his tongue is large and red, and he has a large appetite. The patient is undoubtedly the subject of syphilis contracted five years ago. The treatment, which has benefited him little, has consisted in large amounts of mercury and potassium iodide internally with counter-irritation and cupping to the spine. He has also been treated with biomides, nou and stychnine. For the glycosuria he was given opium and a diet almost free of carbohydrate.

Case 2 Locomotor Ataxy—The second case of interest I have to show to the Society is presented in this patient, a Hindu, aged 28 years. He was admitted into my wards three months ago suffering from very marked ataxy in all four limbs. He could not walk without assistance, but could just manage to stand alone.

Rombergism was marked. The deep reflexes were totally absent, the superficial were all easily obtainable. He complained of tingling and gnawing sensations in his hands and feet. The tone of the muscles was fair, and there was no wasting, nor any loss of sensation. The above is a summary of all the abnormal signs and symptoms presented by this patient on admission. Since then his condition has altered in the following points. He can walk alone now, and the ataxy in his limbs is very much less than it was. The subjective sensations he experienced in his hands and feet have disappeared, but otherwise he is in the same state. Lately he has developed the Argyll-Robertson pupil and has begun to suffer from lightning pains at night. The interest of this case lies in the unusual manner of onset of the disease, *viz*, with marked ataxy, not only in the lower but also in the upper limbs. There has been no affection of the bladder at any time. His illness began about a month before admission with difficulty in walking and in using his hands, and he grew progressively worse until admission. There is no distinct history of syphilis, and the man attributes the onset of his complaint to bathing in cold water on a hot day. He has been treated with iodides and other drugs, but seems to have benefited most under large doses of arsenic. The optic discs were examined and found to be normal.

Case 3—The last case I have to show is this man, a Hindu, aged 30 years. He contracted syphilis three years ago, and on admission a month ago presented semi-elastic fixed swelling the size of a hen's egg over the right parietal eminence, and another the size of a small apple over the manubrium sterni. This swelling was also firm, semi-elastic and fixed to the bone. He also had decided thickening of the lower third of his right tibia. The swellings had appeared three months before admission, and had steadily increased in size. Considering the man's history and the character of the swellings, they were naturally diagnosed to be gummata, and the patient was placed on large and increasing doses of iodide of potassium, until he was taking as much as 80 grains a day. Mercury, locally, internally and hypodermically, was also given. Under this treatment the parietal and tibial swellings gradually grew smaller, but the sternal, on the other hand, increased steadily in size, until it has reached the size you see now, *viz*, that of a small coconut. It is very firm, tender and inclined to be nodular, and I think that there is little doubt that it is now a sarcoma, whatever it may have been when it first appeared. I can cite no authorities for a gumma becoming sarcomatous. Considering that a gumma is a chronic inflammatory growth in which connective tissue elements play a large part, I can see no strong argument against the supposition that here we have had a gumma taking on a sarcomatous action.

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HELOUAN AS A HEALTH RESORT FOR
ANGLO INDIANS

It is a curious fact that a majority of Europeans in India have passed on their homeward or outward journeys the land of Egypt many times, but have never thought it worth while to stay any time there.

We can, of course, understand the reasons for this. On our way home we are anxious to get over the journey as soon as possible to see our families and relatives. We have no time to halt on the way out, for we have left England at the last possible moment. So Egypt is passed by without any further notice than can be gained by the day in the Canal and half a night at cosmopolitan, Port Said—

Yet on consideration surely this is strange. From Europe numerous invalids are sent every winter to Egypt, yet we Anglo-Indians often imagine that "leave home" is the great panacea, forgetful, or wishful to forget, the trials of an English winter, or the still more treacherous spring. Yet if Egypt has attractions for the invalid from Europe, surely it may also appeal to the invalid from India.

Our attention has recently been directed to the many virtues of Helouan as a health resort. A distinguished Medical Officer who has recently returned gives a very pleasant account of it, and has furnished us with the material for the following description of this place.

Helouan or Helwân is a small township, 15 miles south of Cairo, in the desert and within 3 miles of the Nile. It is 200ft above Nile level. It is a modern town, chosen for the site of a palace by the late Khedive, H. H. Tewfik Pasha. To the East arise the tertiary limestone Hills of Mokattam, the rounded summits of which rise to 1,500 ft above the sea-level. Just across the Nile lie the towns of Bedrashen and Memphis. In the former may be seen the Egyptian fellahs in his primitive condition, and at Memphis are the widely-renowned ruins of that city, founded 6000 years ago, near it too is the famous "step" Pyramid and numerous other remains of the greatest archaeological interest. The air of Helouan is the air of the desert,

usually described as free from germs and all organic matter. Be this as it may, the air is certainly pure, dry, bracing and invigorating. There is bright sunshine for 8 hours a day. The range of temperature is far less than at Luxor or at Assuan, and a well known authority on health resorts has testified that he experienced "no appreciable chill at sunset." The relative humidity is low.

Helouan is not a windy place, and still more important it is not a dusty place. Those of us who have lived in Upper India know what a dusty place means. Dust-storms of a kind common in Upper India are unknown, especially in the winter months, when Egypt is recommended for invalids. The average rainfall is less than three-quarters of an inch, so Helouan may be considered practically rainless.

The arrangements for baths and thermal waters at Helouan are admirable. They belong to Government and are in charge of an English Medical Director. The new bath establishment, opened in 1899 by H. H. the Khedive, is equal to anything of the kind in Europe.

In the building will be found immersion baths, 30 separate dressing rooms, needle baths, douches of all kinds, electric, vapour, steam, hot-air, dry and wet inhalation, with waiting rooms, cooling rooms, and every kind of convenience. In addition there are the "special baths" in which, while the body of the patient is immersed in sulphur water running over him at any desired temperature, massage can be carried out by trained European masseurs.

The waters of Helouan have been known since 1600 B. C. and probably long before that. They are of three kinds, sulphur and saline, salt and chalybeate. The springs are so abundant that they are allowed to run to waste day and night. The chief water employed is the sulphur and saline, the temperature of which can be regulated at will. There is a large open air swimming bath 60 yards by 20 yards, at a temperature of 70° to 75° F. The tariff is low, and the hotels good. The supply of drinking water at Helouan is good and plenty.

The place is strongly to be recommended for persons in India who have been worn down by continued attacks of fever, for those in a neurasthenic condition, for sufferers from rheumatic trouble and for persons recovering from attacks of dysentery or chronic diarrhoea. It is on the way to Europe, within ten or twelve

days of Bombay, and even for the healthy it forms a pleasant half-way house for those who have to take their leave in the cold weather and who do not look forward with pleasure to an English winter or early spring

SPECIAL RESEARCH IN INDIA

NUMBER 13 of the new series of Scientific Memoirs by medical officers in India is devoted to an account of some recent researches into the complaint known by numerous names but best, if vaguely, described as Oriental Sore

This monograph is by Captain S P James, MB, FMS, it does not profess to be an exhaustive account of the clinical symptoms and pathology of this disease, but only deals with certain points in its etiology. Our readers will remember that some astonishment was excited by the announcement that the parasites known as Leishman-Donovan bodies had been found in these ulcers or sores, and the theory was made to explain this as one of the ways by which these parasites escaped, and the infection spread

There can be no doubt that the bodies found in these sores and in cases of tropical splenomegaly or cachexia are indistinguishable by the microscope, it is not, however, meant that they are identical. The present monograph does not refer to Roger's cultivation of these "bodies," which appears to us to be a method whereby they could be distinguished from the similar looking "bodies" found in these sores. At any rate Captain James has settled the fact that these "bodies" do not occur in ulcers found in Assam, where *kala-azar* and the Leishman-Donovan bodies are very common, and also in cases of malarial cachexia with enlargement of the spleen in the Punjab these "bodies" are not found. From this we learn two important facts, first, that the parasites or "bodies" found in the splenic cachexia of Assam, Madras and Eastern Bengal are not identical with, though strongly resembling in appearance, the "bodies" found in oriental sore or tropical ulcers, and secondly, there is a real form of splenic cachexia, *re*, our old friend "malarial cachexia," which is very common in the Punjab, and which is not due to the Leishman-Donovan infection. This is a very important matter, and it yet remains to be settled whether all cases of splenomegaly and cachexia found in Madras, Eastern Bengal and Assam are due to Leishman-Donovan body

infection, or as we think highly probable, there are two forms of splenic cachexia, one due to chronic malarial fever, and the other due to infection by the new parasite discovered by Leishman and Donovan

We heartily welcome such monographs as that by Captain James, and we are strongly of opinion that the plan revived of recent years of putting certain selected medical officers on special duty for special investigation has been productive of great good, and we can only plead for a further extension of this method of promoting research. Much still remains to be done, for example, when will the question of the degree of prevalence of typhoid fever among natives be settled? This can only be done by a special committee of clinicians and bacteriologists, and till this is settled how can we pretend to have got to the bottom of the etiology of this most formidable disease of the European in India. Take again dysentery. This is a vast subject, and but comparatively little has been done in India of recent years as regards its etiology. To what degree does amoebic dysentery prevail? is there such an entity as "amoebic dysentery" (the question has been asked)? to what degree do modern researches into "bacillary dysentery" apply to India? Only one or two writers in India have touched on these points

But it is by no means certain that what is true, for say, Calcutta or Burma, is true for the Punjab or other parts of India. Therefore, we urge the necessity for further research, by specially selected medical officers. We have indicated only two of the many subjects that still await examination, but in India of all tropical countries it cannot be said that we have done all that is necessary, when we are still ignorant of the degree of prevalence of typhoid among Indians, and of the etiology of dysentery

LONDON LETTER

THE FALLING BIRTH-RATE OF GREAT BRITAIN

THE Report of the Registrar-General for the year 1903, recently issued bears evidence of a decrease in the birth-rate of the United Kingdom. As compared with the preceding decade there is a difference of 19 per 1,000—minus, the respective rates being 29.8 and 27.9. On the other hand, there is a fall of 3.4 in the death-rate, the figures being 19.0 and 15.6, so that there is still a margin of increase of the population. Whether this is a source of un-

qualified satisfaction is doubtful. The larger survival and more extended age of the living implies a bigger and growing population, but do not necessarily mean a stronger race and sturdier stock. There must be a greater proportion of weaklings in existence. Unless sanitary and medical science which has brought about the saving and lengthening of life has also produced improvement in the physique and health of the inhabitants of these isles. Great Britain is not alone in showing a diminished birth-rate. Greater Britain displays a more striking diminution—Australia and New Zealand display startling reductions in birth-rates which cause well founded apprehension regarding the future of these colonies. The death-rate have also been lowered. Of all larger European States Russia shows the highest birth-rate, 49.0—which is an advance of 2 on the decennial rates. Her death-rate, which is very high, has fallen from 34.5 to 31.9. Hungary comes next with a rate of 42.6 diminished to 36.7, the death-rates being 31.2 and 26.1. Austria shows corresponding figures of 38.0 and 37.0, 28.7 and 24.7, the German Empire 35.9 and 35.1 and 24.1 and 19.4, Italy 36.5 and 31.5 and 25.2 and 22.2. Spain exhibits a rising birth-rate—35.8 and 36.4 and a falling death-rate—30.1 and 25.0. The results for Belgium are 29.6 and 27.5, 20.3 and 17.0. The birth-rate of France is, as is well known, habitually low and still inclines to fall, the numbers are 22.8 and 21.1, the death-rates being 22.5 and 19.3. The report does not represent data for the United States of America or Canada. Russia and Spain are therefore the only European countries which have a rising birth-rate. Figures for Japan are only available for the decade 1891-1901, but they indicate enhanced fecundity, 26.8 and 32.7 and lowered mortality—22.7 and 20.3. In view of the great drain which the war is making on her adult male population these circumstances must be subject of satisfaction to her. These statistics are most interesting and suggestive, but the conditions and causes of which they are the outcome are complex and difficult of discussion and explanation. They lend themselves to various interpretations and, especially in the case of our Southern Colonies, justify somewhat gloomy views for the future. The diminution of death-rates, which is without a single exception is, however, cause of unmixed gratification, and in this respect the United Kingdom presents a

conspicuous pre-eminence. The death-rates of the Southern Colonies are markedly lower than those of the mother country, but this is probably due to peculiarities in the composition of the population. The rates for New Zealand are 10.2 and 10.4. These are certainly very astounding figures if correct. The rate of natural increase of the colonists is very high notwithstanding the declining birth-rates. The same remark applies to the Australian Colonies and Tasmania.

UTILISING THE APPENDIX VERMIFORMIS

NOT long ago Sir William Macewan strove to assign to the appendix a physiological function. Now, if we are to believe a telegraphic report from Washington, a therapeutical use has been found for this much maligned diverticulum. It appears that one Sergeant Mould was suffering from dysentery in a military hospital and that it occurred to an Army Surgeon—name not reported—to cut down on the appendix, open it, introduce a solution of quinine through the aperture and flush the colon therewith. The result is said to have been satisfactory. It is not stated whether the dysentery was amœbic or bacillary. Quinine is known to be fatal to the amœba coli, and it has been proposed in cases of amœbic abscess of the liver to flush the cavity with a solution of this drug. The expedient of opening the appendix and introducing an injection through it is certainly very ingenious. One never knows how high a rectal injection can be made to travel, but by this plan the large intestine can be washed from end to end. And if a quinine solution can be injected safely and effectively in amœbic dysentery, why not a nitrate of silver or boric injection which has been found so serviceable in chronic dysentery. Injection of salt or quassia might also be used in this way in the treatment of ascarides, and perhaps other intestinal parasites might be attacked in the same manner. I shall watch with interest for mention of this matter in the medical journals.

DR DOYEN AND CANCER

DR DOYEN of Paris has been lecturing in Brussels on the subject of cancer. He claims that he has succeeded in causing cancerous growths in animals by the injection of the "micrococcus neoformans." He also claims to have made a step in advance in the means of diagnosing cancer. His plan is to mix nine drops of a serum which he has prepared from

the micrococcus neoformans with one drop of the patient's blood. The injection of this material is said to cause a characteristic reaction in the suspicious growth. It is a little suspicious that these Doyen proceedings and results make their appearance from time to time in the lay newspapers, and that the medical journals take little notice of them. Dr. Doyen is about to publish an account of his researches. He still considers early operation to be the best way of treating cancer, but asserts that the use of his serum is advantageous as a preparation for operation and as a safeguard against infection of the wound after operation. Another serum is being made the subject of experiment in America. The whole subject of cancer is in a most unsettled state, and the number and variety of announcements regarding its cause and cure are quite bewildering. It seems quite certain that we are still ignorant regarding its pathology and treatment otherwise than by surgical operation.

PEMPHIGUS CONTAGIOSUS

MAJOR W. TURNER, R.A.M.C., describes in the March number of the *Journal of the Royal Army Medical Corps* a small epidemic of this disease among British Soldiers in Multan in the summers of 1903 and 1904. His account of the characters of the affection accords very closely with the graphic description given by Manson in his "Tropical Diseases." The disease is not according to my experience a very common one in India, but I have met with several cases of it. The most interesting point in Major Turner's paper is his discovery of Leishman's body in scrapings from the floor of the blebs. The slides were shown to Major Semple, R.A.M.C., and the diagnosis of the parasite was confirmed by his very competent judgment. Manson pronounces the disease to be of parasitic causation and mentions that he found a diplococcus "in the epidermis and fluid of the blister." It is possible that this diplococcus was the Leishman body seen in pairs, but a detailed account of the parasite, its size and staining re-action is not given. Major Turner seems to surmise that these blebs are the vital stage of Delhi boil, in which Wright discovered the same body. The lesions caused by the two diseases are very dissimilar, the long duration and destructive course of Delhi boil being very different from the short course and very superficial disturbance of the integrity of

the skin in the other. Vesicular phenomena have never been mentioned in description of Delhi boil, and Fleming's well-known experiment do not indicate this as a feature or stage of the malady. The granulomatous conditions seen in the "Oriental sore" is entirely absent in Pemphigus Contagiosus. Destruction has been held to constitute a prominent mark of local infection by the Leishman parasite elsewhere. These are important points, but Turner's discovery is, nevertheless, a very remarkable one, and adds another puzzle to the already somewhat obscure and enigmatic pathology of this parasite.*

THE CULTIVATION AND DEVELOPMENT OF THE LEISHMAN BODY

THE same number of this journal contains a full description of recent researches by Major Leishman and Captain Statham regarding the developmental phases which this parasite undergoes under cultivation. The observations were made at Netley from subjects dying of "Dum-Dum fever." The paper is a very valuable one, and takes into account the previous observations of L. Rogers and F. Schaudinn. It is well worthy of careful perusal and constitutes a substantial addition to our knowledge of this intensely interesting matter. The general conclusion is that the "spleen parasites" or 'Leishman bodies' are undoubtedly a stage in the development of a flagellated organism, and, further, that nothing has yet been observed in the flagellated forms inconsistent with their eventually proving to be trypanosomata.

THE ROYAL ARMY MEDICAL COLLEGE

THE Secretary of State for War recently stated in the House of Commons that a sum of £100,000 had been assigned for the purpose of erecting the new Army Medical College, that the contracts had been signed and that a commencement of building operations was to be made at once. It is estimated that three years will lapse before the completion of the institution. It is now nearly four years since it was recommended by Mr. Broderick's Committee that immediate steps should be taken to provide a college and hospital for the instruction of Army Medical Officers. Truly official projects drag their slow length along.

[* See Editorial above on Capt. James' monograph—Ed. I.M.G.]

THE UNIVERSITY OF LONDON AND TROPICAL MEDICINE

The University of London has resolved to add the subject of tropical diseases to the examination for its degree of M.D., and has affiliated the London School of Tropical Medicine for the purpose of instruction in that branch. This is a step in the right direction.

16th March 1905

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Current Topics.

THE BOMBAY SANITARY ASSOCIATION

We have received the first Annual Report of the Bombay Sanitary Association.

The objects of this Association are as follows — (a) to create an educated public opinion with regard to sanitary matters in general, (b) to diffuse the knowledge of sanitation and hygiene generally, and of the prevention of the spread of disease amongst all classes of people by means of lectures, leaflets and practical demonstrations, and, if possible, by holding classes and examinations, (c) to promote sanitary science by giving prizes, rewards or medals to those who may, by diligent application, add to our knowledge in sanitary science by original research or otherwise, (d) to arrange for homely talk or simple practical lectures for mothers and girls in the various localities and different chawls, provided the people in such localities or chawls give facilities.

The Association already consists of no less than 23 life members and 161 ordinary members.

It is, says the Report, perhaps only a coincidence, but we venture to think it is a happy omen, that the first year of the life of this Association is distinguished by the lowest death-rate in Bombay since the plague began, and the highest birth-rate in the history of that city. Sub-Committees for the various parts of the City have been formed and have paid visits with the view of bringing to the notice of the people the value of personal and domestic hygiene, and it is very satisfactory to see the large number of native gentlemen who have taken keen interest in spreading the work of the Association.

Health visitors have been appointed, who have visited regularly the worst parts of the City and have explained to the people how to improve their sanitary surroundings. Lectures have been given on all sorts of sanitary subjects by medical and non-medical men, courses of instruction in Elementary Hygiene have been held. Leaflets in English and the Vernacular have been distributed.

The Health Section of the Industrial Exhibition has been one of the first fruits of the work of this Association.

The Association has certainly made a good beginning, and we wish it every success.

MEDICAL OBSERVATIONS IN TIBET

We learn from a discursive note by Capt Aldridge, R.A.M.C. (*Journal, R.A.M.C.*, February) that several interesting medical observations were made by I.M.S. officers in Tibet. The following table gives a summary of some observations made by Capt W. B. Turnbull, I.M.S. (recently Medical Officer with the Kabul Mission) —

	Red blood corpuscles	Leucocytes	Ratio
W. B. T. at Rungpo (1,800 ft.), average of 12 observations	5,184,000	9,584	$\frac{1}{250}$
W. B. T. at Chungu (12,500 ft.), average of 14 observations	5,652,000	8,136	$\frac{1}{265}$
Residents in the country (Tibetans, Sharpas and Sikimese), average	6,275,000	10,820	$\frac{1}{280}$
British officers who had lived at 12,000 ft. and over for several months	6,787,250	9,911	$\frac{1}{288}$
Natives who had lived at 12,000 ft. and over for several months	6,668,000	10,948	$\frac{1}{290}$
New arrivals at Chungu (12,500 ft.), chiefly British officers passing through	5,723,600	9,634	$\frac{1}{288}$

The hæmoglobin percentage was found to rise and fall with the rise and fall of corpuscles. Differential leucocyte counts showed them always to remain in their normal relative proportions to each other. The isotonic point was not altered from normal. These results agree in the main with those of previous observers.

Judging from the rapid increase of the number of red blood corpuscles and the absence of normoblasts on arriving at the higher altitudes, and of any signs of blood destruction, such as high-coloured urine, jaundice, &c., on descending to lower altitudes, Captain Turnbull thinks the increase in the corpuscles is relative, and due to a decrease in the proportion of plasma, and not a compensatory increase to allow of the carrying of more oxygen, as has been supposed by some writers.

Of 300 cases examined by Captain Turnbull, malarial parasites were found in 57, benign tertian, 28, quartan, 3, malignant tertian, 260. There were of course relapses in the persons of coolies from India. At Chungu, 12,500 ft., no mosquitoes were found, but at Rangpo, 1,800 feet, *Anopheles* and *Stegomyia fuscata* were met with. At Chumbi a *Gigas* was noted, and it is stated that there is "no evidence that fresh malarial infections occurred in Tibet proper."

There was, as might be expected, as the troops were chiefly of the Indian army, very little typhoid fever. Captain Aldridge mentions two typical cases in Tibetans which were under the charge of Lt. Abbott, I.M.S.

STERILISING WATER IN THE FIELD

A NUMBER of devices for effecting the sterilisation of drinking water for troops in the field were to be seen at Millbank Barracks recently.

Three main methods were represented, depending respectively on chemical means, on filtration, and on heat. Of chemical processes there were six, and the first, that of Schumburg, a bromine solution (bromine, bromide of potassium and water), contained in glass capsules holding 2 c c each, is employed. Each capsule is broken into one litre of water, which, after a period varying from seven to thirty minutes, is treated with a mixture of sodium sulphite and sodium carbonate, which neutralises the bromine and removes its odour in about two minutes. Experiment shows, however, that the water is liable to have a stale taste, and the necessity of carrying about a number of fragile capsules containing liquid is an obvious objection to the use of this method on the field. The second process, that of Vaillard and Georges, depends on the action of iodine. Three tablets are employed, the first containing iodate of soda and iodide of potassium with a blue colouring matter, the second tartaric acid with a red colouring matter, and the third hyposulphite of soda. Sterilisation requires ten minutes, and after the process is complete the water has no smell, and presents little, if any, perceptible difference from untreated water. In the third process (Nesfield's) the water is first treated with bleaching powder and bicarbonate of soda, and after sterilisation is complete—about ten minutes—sodium sulphite is added to render it free of chlorine and tasteless, this, however, it seems to be difficult to do perfectly. The fourth process consists simply in the addition of about 15 grains of bisulphate of soda to each pint of water, it was tried in South Africa, but the men objected to the taste imparted to the water (though this can be got rid of by the addition of bicarbonate of soda), and a further objection is that the treated water is found to take up iron from the water-bottles (14 grain per gallon in six hours, and 35 grains in twelve hours). The fifth process is the old one of adding permanganate of potash, the pink colour imparted to the water is not liked by the men. The sixth process consists in the use of copper sulphate or chloride. The experiments of Dr. George Moore, of the scientific staff of the United States Government, seem to show that a sulphate of copper solution of the strength of 1 in 100,000 is able to kill both typhoid and cholera germs in four or five hours at laboratory temperatures, but from experiments made in this country by Rideal and Baines, it appears that this strength is ineffective, though a 1 in 10,000 solution kills typhoid, though not cholera, bacilli, and 1 in 1,000 kills both. In this connection mention may be made of an interesting observation which tends to show that water kept for twenty-four hours in clean copper vessels is freed from bacillus coli and bacillus typhosus, this suggests that the employment of copper water carts might be advantageous. In the second class of apparatus, depending on filtration, various forms of the Slack and Brown-

low field service filter were on view, also a service water cart fitted with the same filters. The other water carts were the Bailey-Denton, with a clarifying filter of charcoal and a Berkefeld filter for sterilising, and the Lefebvre with a filter of asbestos and charcoal. But all filters have the disadvantage that the rate of flow soon falls off, and if they are not cleaned and boiled at fairly frequent intervals they become almost worse than useless. In the last group of appliances, where heat is employed for sterilisation, five different varieties were on view. Of these the Leigh Canney is merely a device for boiling water rapidly, unprovided with any cooling arrangement, while the Lefebvre steriliser is no novelty. The other three all have a heat-interchanging device by which the incoming water is warmed at the expense of the heat of the out-going sterilised water, which thus issues at a fairly low temperature. Among these the Griffiths machine, described in the *Times* of January 13th last, is distinguished by the fact that the water is not actually boiled but simply raised to about 175 deg. Fah., a temperature which the inventor believes to be more than sufficient to destroy all water-borne pathogenic organisms. Weighing 120 lbs without its case, it was found in the tests to deliver 60 gallons of sterilised water an hour with a consumption of one and a half pint of oil, and probably this consumption would be reduced if modifications were made in the heat-exchange apparatus so as to cool the effluent water below the temperature at which it now issues—79 deg. Fah. to 92 deg. Fah.—according to the experiments. The other machines—those of Lawrence and of Forbes—deliver the water at a temperature some 20 deg. or 25 deg. lower, but then yield is much smaller.—(*Sanitary Record*)

We quote the above from our contemporary, but there is no use in devising methods of boiling water, unless a good method of rapidly cooling it also accompanies.

THE PASTEUR INSTITUTE, KASALI

THE 4th Annual Report of the Pasteur Institute at Kasali issued by Major Semple, the Director, is a record of good work and of increasing usefulness. In the four years of its existence the number of patients has risen from 321 to 612, and out of these 612 in only five cases protection failed to be given. These 5, all natives, all contracted hydrophobia more than 14 days after completion of treatment. All had been severely and deeply bitten on the bare body, and all except one had arrived late for treatment. In five other cases, also Natives, hydrophobia supervened during or within 14 days of treatment, these are not classed as "failures" because their nerve centres had become invaded by the virus before it was possible to render them immune. It may be noted that European patients on the average arrived more than four

days earlier than Native patients. Owing to the thin and scanty clothing Native patients are often worse bitten, i.e., receive more of the virus, than do European patients, hence the vital importance in these cases of early treatment, and the orders of Government should be such that no time is lost in awaiting orders or permission in the case of Government employees.

We also note that the Institute has done a considerable amount of other work, large quantities of anti-venomous serum, of anti-tetanic and anti-diphtheritic serum, were prepared and issued free to Government institutions. We note that the snake-bite serum is specific for cobra only, not like Calmette's supposed to be good for many kinds of snakes. Moreover, other serums against daboia poison and by using a mixture of cobra venom and daboia have been prepared and are being standardised, this work being under the charge of Captain G. Lamb, I.M.S.

THE Government of India Resolution on the despatch of the Secretary of State on the pay of the Civil branch of the I.M.S. has just been published, too late to be fully noticed here. The result is that the pay of officers in civil employ, has been raised in a degree corresponding with the pay of their *confères* in military employ, with effect, however, from April 1st, 1904, not from August 1903, as was expected.

Civil Surgeons of the second class (the majority), get Rs. 50 a month less, and Civil Surgeons of the first class (a minority), get Rs. 50 more, than officers in military employ of the same standing, but of course Civil Surgeons get in addition the usual allowances for Jails, Asylums, &c. The pay of several appointments, especially in the Medical Colleges, is increased. There are now numerous stages at which increased pay is received, and this is entirely good.

The changes may be summed up by saying that the junior officers and the senior officers receive substantial additions in pay, while junior Majors receive little or nothing.

The new pay rates on the whole are a substantial boon, and we hope that the Government of India may be able, in the end, to carry out their intended improvements in the pay of I.M.S. officers in the Jail Department.

THE Annual Report of the Presbyterian Mission Hospital, Mutaj, has been received. It is full of surgical interest, the medical men attached to the hospital do an enormous amount of good surgery every year, and we have been pleased at times to publish some of the results. We note that Rost's leprolin was used in three cases in December last, and the "immediate results were most gratifying."

THE question of tuberculosis among prisoners is one of great importance in India as well as in

other countries. We note that in the Indiana Reformatory, near Baltimore, U.S.A., Dr. Reed of the Johns Hopkins Hospital and Dr. H. C. Sharp have carried out a series of examinations of the convicts in this institution, out of 950 inmates from 17 to 35 years of age it was found that 24 were in an advanced stage of tuberculosis, and 102 gave a definite tuberculin reaction, that is, 13 per cent of the inmates were tuberculous. No data as to air space, ventilation are given, nor is the question discussed as to whether the disease was imported or produced in the jail after conviction.

A COMMITTEE was recently appointed, and 5,000 dollars appropriated for the study of "tropical anæmia" at Porto Rico. A report has been published on 951 cases of anæmia treated near San Juan.

The conclusion is that in 947 of these cases, uncinariasis (or what in India and elsewhere is known as ankylostomiasis) is the cause of the anæmia. The hospital tent was then removed to Uttado, and hundreds of patients were treated.

The main result (according to the Journal A.M.A.) is that the anæmia which affects 90 per cent of the inhabitants of Porto Rico, is due to uncinariasis, and therefore that the disease is in most cases curable. The article quoted refers to Bentley's advocacy of betanaphthol (I.M.G., April 1904), and the Committee record that "this drug which is only one tenth the cost of thymol is an ideal vermifuge, except for causing dizziness, and is destined to eclipse thymol and male fern."

The report also confirms the observations of Bentley and Looss on uncinari dermatitis or *pani ghao* as it is known in India.

The whole report is a most valuable study of anæmia, but we should like to see a comparative study of persons apparently healthy. We may recall the experience of Assam, and, as a matter of fact, 70 to 80 per cent of the inhabitants of many parts of India harbour the ankylostoma in considerable numbers, and to all intents and purposes are healthy men. It still remains to be shown what degree of ankylostoma infection affects the health.

WE desire to call attention to the advertisement of the "Craggs Research Prize," which will be awarded in October, to the past or present student of the London School of Tropical Medicine for the most valuable contribution to tropical medicine made or published during the current year. The fact of the work having been already published does not disqualify. Essays, in English, must be sent in before 1st October next to the Medical Tutor, London School of Tropical Medicine, Royal Albert Dock, E. London.

DR. D. H. DOLLYMAN article entitled "Germs in Blank Cartridges" states that "there is

abundant evidence that the wads of certain blank cartridges contain the bacillus tetani" (*J A M Assoc*, 11th February, p 468)

A NEW book in German on Tropical Medicine is announced, under the editorship of Dr Carl Mense of Kassel, the editor of the well-known *Archiv für Schiffs-und Tropen Hygiene*. The following British writers contribute to the new volume—Surgeon Bassett-Smith of Haslemere and Leishman of Netley, Carroll of New York writes on Yellow Fever, Looss on Worm Affections, MacCallum of Baltimore on Tropical Liver Diseases, Ruge of the German Navy on Dysentery, Hans Ziemann on Malaria, Prof Rumpf of Bonn on Cholera, Baelz of Tokyo on Beri-beri, and Major Leishman on *Kala-azar*, we presume the latter subject was handed over to this author on the strength of his discovery of the Leishman-Donovan bodies. The book will consist of 354 pages with numerous illustrations and 9 plates. The price will be 12 marks.

THE interesting letter which we publish giving details of the injuries received in the earthquake at Dharmasala, enables us to realise more clearly the terrible nature of the calamity, and at the same time to appreciate the splendid work done by the Medical Officers at Dharmasala, and in the Kangra Valley.

WE direct attention to the wonderful account, quoted in our Service Notes, of the Japanese methods of field medical organisation.

Reviews.

Plague its Prevention and Cure—By KOBIRAJ D D GUPTA. The Ehn Press, Calcutta

WE are at a loss to know if we should take this pamphlet seriously, but as it consists of lectures originally read before the Calcutta Sahitya Sabha "and published (says the preface) in the Journal of that erudite assembly" we must presume it represents the views of a section of the medical practitioners of India.

The first part of the book is taken up with showing that the disease now known as plague, is identical with the Sannipata fever of ancient writers of India, which, however, has also been identified with typhus. We can scarcely be expected to regard with any thing but amusement the following obsolete physiology on which the pathology of this disease, now identified as plague and again as typhus, is based—

"The phlegm, the wind, and the bile are respectively located in regions, situated above, below or about the part of the body lying

between the heart and the umbilicus, or to put it more explicitly, the wind has its seat in the region of the abdomen lying below the umbilicus, the bile is located in the region of the stomach (lying between the heart and the umbilicus), while the phlegm has its location in the upper part of the cardiac region.

The three fundamental humours, such as the phlegm, the bile, and the wind, successively become dominant in the different stages of life, and in the different divisions of the day, and rule the progressive stages of digestion, just in their order of enumeration. Thus the phlegm marks the growing days of infancy, the bile becomes dominant in youth, while an excess or an abnormal accumulation of the bodily wind, characterises the closing days of life."

The little pamphlet goes on rambling in this manner for many pages, and we frankly confess we are at a loss to know what the author means.

We turn therefore to a section, headed prevention (p 27) in the hope of seeing something intelligible, and we are greeted with the announcement, in leaded type, of a remedy which used as a "plague prophylactic" "has never failed within a test period of consecutive years." "This Ayurvedic medicine of tested efficacy," we find after wading through many pages, is a portentous mixture of no less than 15 drugs, of which the best known are oxide of mica, mercury, sulphur, camphor, dathuia, and Indian hemp. We are also asked seriously to believe that this absurd specimen of polypharmacy not only never fails as a prophylactic for plague but it also "cures 18 different types of leprosy," "twenty forms of gonorrhoea" (shades of Ricord!), such trifles as boils, sinuses, fistulae, and "all forms of elephantiasis," goitre, hernia, dysentery, piles, phthisis, "seminal waste." "It makes an old man as sprightly as a youth and able to unremittently enjoy the pleasure of the nuptial bed. By using it a man may visit 100 wives without any fag or fatigue, be as powerful as a mad elephant, and acquire a vision clear up to the extent of 1,600,000 miles. By using this preparation the god Vishnu, the lord of the Universe, continued to be the favorite with a hundred thousand damsels."!!! We have quoted this utter rubbish because it is important nowadays to have it known how absurd are the claims made by this obsolete class of practitioners to recognition. Nevertheless it was a month ago seriously proposed in the Punjab University, by an interested section, to further endow the teaching of this rubbish!

We have not noticed a hundredth part of the absurdities with which the pamphlet is beset. We have read it with interest and it is of value as showing the attitude of mind of the practitioners of this ancient art, it emphasises the absurdity of their claims, and for that purpose its publication will possibly be of value.

The Teachings of Zoroaster—By S. A. KAPADIA, M.D., L.R.C.P. London JOHN MURRAY 1905 Pott 16mo Price, Rs 2

THIS is the first of a series of little books to be brought out by the editors of the Orient Press and published by John Murray. The series is entitled "The Wisdom of the East," and will consist of the writings of the philosophers and moralists of the East, *eq.*, Ibn Tufail, Confucius, Lao Tzu, Mahomed, &c. It will include "Idylls from the Bible," "the Rose Garden of Sa'di," "the women and wisdom of Japan," "the Veda of the Hindoos."

We are in sympathy with the movement and would be glad to see a series like this read and understood by the people of England. We cannot however honestly congratulate the writer to whom the exposition of the wisdom of Zoroaster has been entrusted.

We are of opinion that no one who is ignorant of the religion of Zoroaster will be much wiser at the end of his perusal of this little volume. It is very disappointing, and any one wanting to learn or understand anything of this religion had better turn to—say the *Encyclopædia Britannica*. We sincerely hope the following volumes will be better.

Malaria, its Causation, Prevention and Treatment—By JNANENDRA N. BAGCHI, L.M. & S.

THIS is an excellent little volume on malaria. It is written in Bengali, so we do not pretend to be able to read it through. It is however quite up to date, and gives a full description of the malaria parasite, mosquitoes and malaria, and symptoms. Epidemic malaria has a chapter to itself, illustrated by the great epidemics at Hyderabad, Ghazipur and Baidwan. Other chapters deal with malarial cachexia, ætiology of malaria, diagnosis and much space is devoted to treatment, medicinal and dietetic.

We can thoroughly recommend the little book to Indian medical men who prefer reading a book in the vernacular. We would like to see the book in the hands of every Hospital Assistant in Bengal and we congratulate Dr. Bagchi on having brought out the book.

The Diagnosis and modern treatment of Pulmonary Consumption—By ARTHUR LATHAM, M.D. (London) 1905. Baillière, Tindall and Cox. Second Edition, pp 224. Price, 5s.

THIS is the second edition of a valuable book by Dr. Latham, the author of the Prize Essay on the King's Sanatorium for Consumption and Physician at St George's and the Brompton Hospitals.

The book is one well worth study, and in a very convenient form gives a good clear and practical account of modern views on the treatment of consumption.

In considering this subject our author rightly lays stress upon the avoidance of re-infection, for a patient may not only infect others, but may

re-infect himself, and in a worse degree. The whole of the chapter is good, but we would call special attention to the author's opinion that it were well to disregard Koch's view that tuberculosis in cows is not a danger to man.

He also lays stress upon the vast importance of the factors of close confinement and bad ventilation in the etiology of consumption. The avoidance of what has been called air-sewage is of the most vital importance, yet in India, among the native inhabitants, it is constantly disregarded. Not only do they close up every window and door, but they spend one-third of their lives in drinking air-sewage owing to their pernicious habit of covering their faces when asleep.

Chapter V deals with the open air treatment, which though preached years ago only recently has been listened to. Dr. Latham explains the principles of Biehmer's open air method. No dust, no foul air, no "air-sewage," exposure no drawback, "the consumptive patient needs pure air in all its natural simplicity, he must live in it, bathe in it continually." Buildings intended for consumptives must rival the outer air in the purity of their atmosphere. Rest, abundant and varied diet do the rest.

We particularly commend to our readers the epitome of the conditions necessary for successful treatment given on page 113 of the book.

Good chapters are added on treatment at home, and other forms of treatment, and the treatment of special symptoms.

The following is important: "In deciding on a particular sanatorium for a patient two considerations must guide us, first the character of the medical man in charge, and secondly the climate and position of the institution." Success depends upon the character and perseverance of the physician. As to climate patients should be treated "under the same climatic conditions as those which they are likely to experience in their subsequent life." Air must be pure and free from dust. Moist damp climates are to be avoided, and English patients are warned against warm and moist climates. As tuberculosis "runs a relatively rapid course in warm climates," the success of such an institution in India is doubtful. We commend this valuable and practical book to all our readers.

Saunders' Question-Compends No. 3, Essential of Anatomy—By C. B. NANCORDE, M.D., etc. Seventh Edition, thoroughly Revised. Pages 419. Illustrations 151. W. B. Saunders & Co., New York and London.

THE record of the revision and reprinting of this most useful little book affords the strongest evidence of its popularity. The first edition appeared in 1888 and since then no fewer than seven revised editions and seven reprints have been found necessary.

In the present edition the entire book has been re-read and errors diligently sought for and

corrected. New ideas in relation to the various systems have been incorporated when they have been shown accurate. The chapter on the nervous system has been re-written. The original plan of the work has not been altered.

So much praise has already been bestowed on the production that little more can be said. The present revised edition is as nearly perfect as can be expected in a work of the sort where conciseness is the main object. As a help to the study of the larger works on anatomy—which it is never intended to replace—it has already proved itself, and in the hands of intelligent and sensible students, who know how to make a proper use of it, the question and answer system is of great value in rapid revision of work or in quickly looking up a doubtful point. But there is no denying that a book arranged on this plan lends itself very readily to cramming and to a mere learning off by rote parrot-fashion the answers to a series of questions without the acquisition of any real knowledge of the subject, however, while recognising the limitations inherent in the whole system, we can confidently recommend this "Essentials of Anatomy" as an accurate, concise and ready help in the study of one of the most important and perhaps one of the most difficult of all the subjects in the medical curriculum.

The volume, as might be expected from the name of the firm of publishers, is a very handsome one, well-produced and clearly printed, and the illustrations, mostly derived from well-known sources, are excellently reproduced.

Elementary Practical Physiology—By JOHN THORNTON, M.A., author of "Elementary Physiology," etc. Headmaster of the Municipal Secondary School, Bolton. Pages 324. Illustrations 178. Price 3s 6d. Messrs Longmans, Green & Co., London, New York and Bombay.

THIS elementary work on Physiology is intended to present the more important facts and principles of Physiology in a concise and intelligible form to junior students. The book is divided into twenty chapters. The general anatomy and structures of the body and its organs are described as far as this is necessary to the proper understanding of their functions. There is also included some account of the cell and minute structure of tissues as much as is necessary for an intelligent comprehension of the working of the body and its different parts.

A valuable feature of the book is the large number of illustrations that have been supplied, a few of which are coloured. These are of distinct service, and the student will learn much from a careful and attentive study of these figures.

A useful Glossary giving the pronunciation and explanation of different terms has been added which should be of great value to the beginner in acquiring the proper meaning and use of the technical terms found in the text.

An index and a series of questions and exercises complete the volume. On the whole we may say that the work is well-fitted for the purpose for which it has been written, and we have no doubt that it will be found very useful in teaching the rudiments of physiology in preparatory schools.

A word of praise is due to the way in which the publishers have done their part of the work. The book is well got up, clearly printed on good paper, and the illustrations are excellent, although few of them are original.

Materia Medica for Nursing—By EMILY A. M. STONEY, Superintendent of the Training School for nurses in the Carney Hospital, South Boston, Mass. 300 pp., second edition, thoroughly revised. Philadelphia, New York, London, W. B. Saunders & Co., 1904. Cloth, \$1.50, net.

THE immediate demand for a second edition of this little work on Materia Medica is strong evidence that it has proved of great value to the nursing profession.

This edition has been largely re-written, and while the arrangement of the subject-matter has not been changed, numerous alterations and additions have been made in order to bring the book thoroughly abreast with the times and to make it a more complete guide to those engaged in nursing.

The book is divided into three parts. The first part is devoted to the general considerations and classification of drugs. The second part deals with Materia Medica proper in which all new drugs of actual therapeutic value have been included, their preparations, uses, and doses being clearly and fully described.

The third part or appendix contains poison-emergencies, poisons and their antidotes, emetics, mineral waters, weights and measures, dose-lists, etc.

Besides these there is a useful glossary and a really valuable index at the end of the volume.

We can thoroughly recommend the book as an accurate and carefully prepared work on the subject containing information suitable and sufficient for the purpose for which it is intended.

The Essentials of Chemical Physiology.—By W. D. HALLEBURTON, M.D., F.R.S., F.R.O.P. Fifth Edition. Demy 8vo. Pages 248. Illustrations 83. Price, 4s 6d. Messrs Longmans, Green & Co., London.

CONSIDERABLE change has been made in the arrangement of the exercises in the present new edition of this useful book. A new first lesson has been introduced on the detection of the elements contained in substances of physiological interest, and thus a link is made in the work of the student who passes from the study of pure chemistry to that of chemical physiology. The fats have been made the subject of a separate lesson, and a good many exercises have been inserted in other places. A few of the advanced

lessons, *e.g.*, those on milk, pancreatic digestion, and Kjeldahl's method have been re-written. The chapter on blood has been elaborated, and concise accounts of the theory of immunity of hæmolytins and of the precipitative test for human blood have been added.

The effect of this division has been to bring the book abreast of the advances of science and while the volume makes no pretence to be a complete laboratory guide it gives a very useful and well-arranged choice of exercises, most of which can be readily performed in a practical class.

Some of the more difficult methods of examination have been collected in the appendix.

We have no hesitation in recommending this revised edition to students who are engaged in the practical work of chemical physiology as a useful, accurate and up-to-date help in the study of the subject, and we have no doubt that after working conscientiously through the exercises, they will have a very fair grasp of what is meant by the "Essentials of Chemical Physiology."

Cancer and its Treatment—By A. W. MAYO ROBSON, D.Sc., F.R.C.S. (Eng.) Pages 69. Demy 8vo. Price 3s 6d net. Ballière, Tindall and Cox, 8, Henrietta Street, Covent Garden.

THIS book contains the Bradshaw Lecture which was recently delivered. The infectivity of cancer is first discussed, and cases are quoted showing how necessary it is to remove a cancer thoroughly before cutting into it, and if an exploratory incision has to be made, this should be closed with sutures and everything re-sterilised before proceeding with the operation. The main part of the lecture deals with the treatment of cancer in the various parts of the body, great stress is laid on operation in the precancerous stage and also on early and free removal at the earliest possible date, if this is done a large percentage of cures result, several authors' statistics are quoted in support. The book is in fact a plea for early operation, and the author hopes that the general public may be educated to this view and not be led away by the idea that, at present at any rate, cancer can be cured by either serums or except in the case of rodent ulcer by rays. The printing, etc., is excellent.

A Handbook of Surgery—By F. H. GRIFFITH, M.D., Philadelphia, New York and London. W. B. Saunders & Co.

THIS book contains a short and concise account of the essential points of all the surgical diseases, including as well some bacteriology and an account of medico-legal examinations.

The information is well up to date, and a very large amount has been compressed into a small space. It is essentially a "cram book" and might be useful to students in an out-patient department for ready reference or just before

an examination, but should be supplemented by the study of a large text-book. The illustrations and general appearance of the book are excellent.

The Preparation and After-treatment of Section Cases—By W. J. STEWART MCKAY. Pages xx and 651. Illustrations 134. Size Royal 8vo. Price 15s. Ballière, Tindall and Cox, 8, Henrietta Street, London, W.C.

THIS book contains a very full and elaborate description of everything connected with the preparation necessary for the performance of an abdominal section, the treatment afterwards, and that of any complication which may arise.

The arrangement of an operating theatre, instruments, preparation of the patient, etc., are first discussed. The chapter on the keeping of a case book and also the value of having a consent book in which the patient signs her name agreeing to an operation is well worthy of study.

The general chapter as regards treatment and the complications which may arise within the first 24 hours is good, the author only allows, in this period, sips of hot water by mouth and rectal feeding with saline to relieve thirst. He gives a capsule containing calomel and Pulverisatum co. at midnight of the first day. If everything is going well, and little or no vomiting has taken place, feeding in small quantities by the mouth may be begun on the second day, and in the evening a small dose of morphia combined with trional is given, but only if the case is progressing satisfactorily.

The next few chapters deal more fully with thirst, vomiting, pain, etc., and include much useful information. The author believes strongly in the value of Carnick's liquid peptonoids for rectal feeding. As regards circulatory complications, tinct. digitalis in $\frac{1}{2}$ drachm doses with saline subcutaneously is recommended, but it takes some time to act and is of more value in cases where the heart is weak. Adrenalin and strychnine are also of use, and the value of many other drugs used for these conditions is fully discussed. He regards carbonate of ammonium as much superior to brandy as a stimulant, it can be given in 20-gr. doses by the bowel directly after the operation.

The remainder of the book is occupied with a description of shock, ileus, peritonitis, etc., and is very thorough.

Published cases from various sources, as well as some of the author's, are freely quoted in order to emphasize any particular line of treatment. Instructive tables are included in the chapter on incisional hernia, showing that those cases in which a special fascial stitch was employed had a less percentage of hernia than those treated by simple through and through suturing.

The book is in fact an exhaustive résumé of the subject, and can be thoroughly recommended. The printing and paper are excellent.

Health and Disease in relation to Marriage and the Married State. Royal 8vo Pp 498 Price 30s

UNDER the above title Messrs Rebman, Ltd, have just brought out the first volume of a series of articles by various German writers, introduced and edited by Prof Senator and Dr S Kammer and translated into English by Dr Dulberg. In this volume are discussed, in the relation implied by the title hygiene (*Gruher*), inherited and congenital disease and predispositions (*Orth*), consanguinity (*Kranz*), climate, race and nationality (*Hanelburg*), sexual considerations (*Fürbringer*), menstruation, the puerperal state, etc (*Kossmann*), constitutional diseases (*Senator*), diseases of the blood (*Rossm*), vascular diseases (*Van Leyden and Wolf*), pulmonary diseases (*Kammer*), diseases of the digestive organs (*Ewald*), and renal diseases (*Richter*). The value of a work so exhaustive and representative cannot be over-estimated, the great importance of eugenesis is daily becoming more felt among all classes, and, to aspirants to the state of matrimony, as well as to those who have entered upon that condition, a thousand and one questions constantly occur having reference, not only to the principles underlying the production of healthy offspring, but also to the attitude towards each other of married individuals under varying conditions and from different points of view. To the over-wrought and much be-questioned medical practitioner a ready and reliable answer to every such question is at hand in this invaluable work, and it may therefore be regarded as filling a gap which has long been empty. Not only, however, to the purely professional man should the book prove of benefit, the lucidity of the text of most of the articles is such as to give it a popular value above the average of works which seek to accomplish the double object. The ordinarily intelligent reader will be enabled to glean, from its pages, much important and desirable information, as well as much useful advice as to the best procedure under many of the unforeseen and therefore unpremeditated circumstances which are inseparable from the married life and relations.

Atlas of Human Anatomy for Students and Physicians.—By CARL TOLDT, M.D., assisted by A. D. ROSA, M.D. Translated from the third German edition by DR EDEN PAUL. Six vols 4to Price £3 3s, complete Messrs Rebman, Ltd.

THE publication of this work by Messrs Rebman, Ltd, has brought within the purview of British students and practitioners a most exhaustive and valuable atlas of human anatomy at a rate which, from the appearance of the volumes, the excellence of the fifteen hundred and five illustrations, and the remarkable clearness of the descriptive letterpress appears almost incredible. An arrangement, moreover,

by which any one of the volumes can be obtained singly (at prices ranging from 6s to 16s 6d) brings the advantages of the work within easy reach of specialists and others who may not desire the whole series, each volume being a complete atlas in itself (with independent index) of the particular branch of anatomy with which it deals. Though purporting to be merely a translation, Dr Paul has conceived the happy idea of placing the continental (or more strictly speaking the international) terminology side by side with the English, distinct sets of type being used for each, thus considerably enhancing the intrinsic value of the production. No efforts seem to have been spared to perfect the undertaking, and the authors, translator and publishers are to be warmly congratulated on their combined endeavours which have resulted in the production of a work unsurpassed by any similar book in any language.

Correspondence

THE EARTHQUAKE AT DHARMSALA DESCRPTION OF THE INJURIES

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Dharmasala and the Kangra Valley were visited by an exceptionally severe earthquake on the 4th instant. It commenced about 6.20 A.M., and appeared to travel in a direction from South East to North West. Every house in the station was more or less affected, the majority falling in completely and instantaneously, whilst a few stood partially, and in one house (that of Captain Bateman Champain, 1st Gurkha Rifles) the roof of one room only fell in. There was no time for escape, and with the exception of a very few, all who were not killed were more or less seriously injured.

Killed—30 Europeans (which represents a very large percentage, nearly 50 per cent. of our small community). There were also killed 63 men of the 1st Gurkha Rifles and 135 men of the 7th Gurkha Rifles.

Severely injured—9 Europeans, 28 of the 1st Gurkha Rifles, 55 of the 7th Gurkha Rifles, and 3 Reservists.

Slightly injured—15 Europeans, 73 of the 1st Gurkha Rifles and 117 of the 7th Gurkha Rifles.

The number of deaths of natives in the District may probably be reckoned by thousands.

First aid to wounded was rendered as promptly as possible by Major Hehir, I.M.S., with help of two Hospital Assistants in the 7th Gurkha Rifles and by Major H. Earle, I.M.S., with the help of one Hospital Assistant in the 2nd/1st Gurkha Rifles.

Major Hehir fortunately escaped without being injured, and Major Earle, though hurled in the debris, with comparatively slight injuries, otherwise it is awful to contemplate the horrors that would have been added. Luckily also the surgical appliances, &c., had mostly escaped much damage. The work of rendering first-aid was commenced at the time of the disaster, and was completed at 11 P.M. the same night. The element of shock naturally entered very largely into the cases. The majority of the wounded are progressing very favourably.

The following is a list of the chief cases of injuries—

One British officer—Compression of brain and fracture of internal table of the skull.

One British officer—Injury of pericardium and scalp wound.

Three British officers with fairly severe scalp wounds and general contusions.

Two ladies with simple fractures of thigh.

All the above are doing well.

One Gurkha officer—Crushing of heart and lungs, both ears torn, five extensive scalp wounds, concussion of brain, comminuted fracture of clavicle. Doing well.

Six Gurkha officers—Various injuries, including broken ribs, scalp wounds and extensive contusions. All doing well.

Rank and File of the Gurkha Regiments

One compound comminuted fracture of thigh, amputation. Died.

One fracture, dislocation of spine and fracture of pelvis with rupture of bladder

One fracture, dislocation of spine, who has developed phthisis

One fracture, dislocation of spine without further complications Doing fairly well

One extensive destructive crushing and laceration of front of both legs, exposing several inches of tibia Developed tetanus

One compound comminuted fracture of right leg, tearing anterior tibial artery and nerve Developed tetanus

Five fractures of base of skull One died, two doing well, and two are left with several cranial nerves paralysed

One uncomplicated fracture of pelvis. Doing well

One fracture of pelvis with rupture of bladder Doing fairly well

Nine fractures of ribs One with much subcutaneous emphysema died and one with subcutaneous emphysema and complicated with pneumonia is doing as well as can be expected

Two others were also complicated with wound of lung

Two dislocations of spine Both reduced and doing well

One dislocation of hip joint. Reduced and doing well

Two simple comminuted fractures of thigh

Five cases of simple fracture of thigh

Six cases of compound fracture of leg

One compound comminuted fracture of humerus Ends wired Doing well

Two simple fractures of arm

Five simple fractures of clavicle

Two simple fractures of forearm

One very extensive and severe scalp wound

Two injuries of pericardium with hæmo pericardium

One injury of pericardium and heart.

Five cases of injury of kidneys Three died

As regards the cases that developed tetanus, symptoms commenced on the ninth day after the earthquake

Anti tetanic serum was administered on the tenth day in curative doses, but had no effect All the other compound fractures and crushing wound cases have been given prophylactic doses of anti tetanic serum, and so far have shown no symptoms of tetanus

The complicated case of fracture of the pelvis is interesting in that, after laparotomy, about a cubic inch of the left side of the arch of the pubes was found separated and penetrating the bladder

Most of the thigh fractures have been treated by simple horizontal extension and most of the compound fractures are doing well under conservative treatment

In some of the injured kidney cases urine was voided highly mixed with blood, and in others there was almost complete suppression of urine One case developed uræmia and was treated by diaphoresis and saline injections, but finally succumbed

The cases of fracture-dislocation of the spine were swung and reduced as far as possible and then put up in plaster of Paris

Watson Cheyne's view that shock is due to a state of exhaustion of the medulla and spinal cord, leading to a great reduction in the vital activity generally, and resulting from severe injury of the peripheral ends of the sensory and sympathetic nerves appears to receive valuable confirmation from the cases of wounded in the earthquake, though vasomotor paralysis no doubt was also present in many cases

Medical Aid

There are now five doctors working on the Military side of the station—Majors Hehir, and Earle, I M S Captain Douglas, V C, R.A.M.C., and Lieutenants Whale and Pilkington, I M S

Colonel O'Sullivan, R.A.M.C., also lent valuable aid for some days On the Civil side were Majors Lane, Brown, and Smith, McIver Smith and Captain McKechnie, all of the I M S, with aid of Assistant Surgeons and Hospital Assistants

The Gurkhas, both officers and men, worked splendidly in extricating the wounded and dead There were several very hard cases of people who were on the point of leaving the place losing loved ones, whilst others were, on the other hand, equally fortunate in having just left Several people who had most and perhaps all of their money invested in house property are reduced to indigent circumstances, and, I believe, that only one tea factory is left standing in the District Provisions were very scarce at first, but supplies were quickly sent up by the Civil and Military Authorities as was also medical aid Pioneers and Sappers and Miners have been and are doing yeoman service in extricating bodies of men and animals, and private property, from the ruins, and in repairing roads, bridges, &c.

Cases of extraordinary vitality were those who were dug out alive after three and four days—one man after five days

A dog was unearthed alive after having been buried eleven days All are in tents Fortunately the weather has been fine with the exception of one or two severe thunder storms

Minor shocks of earthquake occurred at frequent intervals during the night following the disaster, and subsequently the intervals gradually increased Now we only get one a day

Geologists state that the Himalayas are of comparatively recent formation, and that there is no reason to doubt that the forces which brought their folds into existence are yet in action It seems a reasonable theory that somewhere under the Kangra Valley and Dharmasala there occurred a caving in of some ill supported portion of the earth's crust and possibly the proximity of Dharmasala to the high ranges may have had something to do with the severity of the shock How ever this may be, it becomes an important question and a very enervating one to those residing there whether further earthquakes will occur in other hill stations in the Himalayas

The obvious indication seems to be that buildings should be constructed of lighter material than they are at present, and no double storeyed houses built

Yours, &c,
SURVIVOR,

Dharmasala, 20th April, 1905

IS CATARACT COUCHING EVER JUSTIFIABLE?

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—As you have been courteous enough to send me the proofs of a paper by Major H Smith, I.M.S., on cataract couching, which you propose to republish in the *Indian Medical Gazette*, for any remarks I may have to offer upon it, it seems only fair that you should at the same time reproduce my paper criticised therein which appeared in the *Ophthalmic Review*, Vol XXII, April, 1903

In the *Ophthalmoscope* for December 1904 in a brief notice of Major Smith's paper I came across the following paragraph, but though objecting to its inferences I decided to take no notice of it "Smith is, therefore, of opinion (despite the views recently expressed by Power, Maynard and others) that lens couching at the present time is not an operation that should be practised outside the ranks of charlatans" As you reproduce the paper at his request, however, I think the two papers should receive equal publication in India and be judged side by side, more especially as Major Smith's paper might lead anyone who had not read the article on which it is apparently based to believe that I advocate couching in preference to extraction A reference to my paper will show this inference to be quite incorrect

In my contribution there were recorded the after-results of 63 operations for depression of the lens by 'sutras' Finding that 46 per cent. of these non selected cases retained good vision after an interval of nearly five years I agreed with Mr Henry Power in his conclusion that under certain circumstances "it would be at least allowable if not advisable to revert to the ancient method of 'depression' for the restoration of light in cases of cataract"

What those circumstances were I did not repeat in the paper as they had already appeared in the *Ophthalmic Review*, but they are now reproduced as Major Smith would seem not to have known them and they are necessary to the understanding of the position (I may add that I do not agree with all of them as justifying couching)

Such a qualified statement as the above can hardly be called 'advocacy' of the operation Like Mr Henry Power, Professor Albertotti and others I regard it as justifiable under certain conditions The fact that numerous eyes, many of them unsuited to the method, are ruined from sepsis and other causes at the hands of itinerant quacks does not affect this conclusion

I am, Sir, &c,

F P MAYNARD

DARJEELING, April, 1905

AFTER-RESULTS OF SIXTY-THREE OPERATIONS FOR DEPRESSION OF THE LENS PERFORMED BY INDIAN "CATARACT PRICKERS" *

By F P MAYNARD, M.B., F.R.C.S., MAJOR, I.M.S.,

Officiating Ophthalmic Surgeon, Medical College Hospital, Calcutta

I HAVE kept notes for some years in district practice in India of cases of depression of the lens met with, the following summary of which may be of interest in view of Mr

* Reprinted from the *Ophthalmic Review*, Vol XXII, April, 1903

Henry Powers' plea for the occasional performance of depression. The cases have not been selected, but represent those which time and opportunity allowed me to note, and occurred chiefly in patients coming for extraction of the cataractous lens in the remaining eye.

The history of "cataract-picking" is of course as old as the history of ophthalmic surgery, and its mode of performance in the East and the instruments used have been described in the *Transactions of the Ophthalmological Society*. It need only be mentioned here that the "suttya" or "mal" who couches in India (in Bengal, at any rate) introduces his needle through the cornea and not through the sclera, and in depressing the lens he is indifferent as to whether he merely depresses it (*depressio*) or turns it over (*reclinatio cataractæ*).

Professor Hirschberg, when visiting India several years ago, was much struck, as we all are at first, with the occasional good result of the operation as performed by itinerant quacks, and attributed it to the earlier age at which cataract ripens in India, and to the danger of depression being less in middle than in advanced life.

The notes of the individual cases are too long to print, so the facts collected are grouped under the following heads—

(1) *Duration of Vision after Couching*—Of the sixty three eyes examined thirty-nine (61.9 per cent.) obtained good or fairly good vision for varying periods. When examined twenty-nine only (46 per cent.) had retained such good vision, thirteen had p 1 only, thirteen had no vision though the eyes looked well, and eight had shrunken globes. In the thirty-nine eyes that had or had had good sight the average duration of vision up to the time of my examination was 4.83 years. In other words, thirty-nine obtained and retained good vision for an average period of 4.88 years. Fifteen eyes retained good vision for one year or less, sixteen, however, kept it for five years or more, and seven of these for ten years or more.

(2) *Degree of Vision after Couching*—Of the twenty-nine eyes with good or fairly good vision when examined, thirteen were tested with glasses by means of square test dots as described in a previous paper*. Five eyes gave $V = \frac{1}{2}$, one each $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{5}$, three gave $\frac{1}{6}$, and two $\frac{1}{8}$. The remaining sixteen were noted as having good or fairly good vision, but were not tested with glasses.

(3) *Influence of Age and Sex*—Fifty eyes were of male, and thirteen of female patients. The average age when couched was 52, twenty-two were over 55 years of age. These gave in eleven eyes good vision, in two p 1, in seven no vision, and two had shrunken globes, thirty were between 40 and 55, and of these fourteen had good sight, eight p 1, four nil, and four shrunken eyes, seven eyes were in patients under 40 years of age, and out of these five obtained good vision and two none at all.

There is no exact way of ascertaining natives' ages, but as far as these figures go age would not appear to influence the results.

(4) *Relation between Fixity of the Displaced Lens and Vision Obtained*—In eight eyes the lens was fixed in the vitreous with seven good results (four of them having $\frac{1}{2}$), and no vision in one eye, in eight eyes the lens was movable, and of these six had good vision ($\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$), and two had p 1 only. The results are better, as indeed might be expected, when the lens is fixed. The constant concussion of a movable depressed lens is certain to be more injurious than the presence of a lens fixed by adhesions.

(5) *Variations in Tension*—(1) *Increase*. Ten couched eyes had increase, mostly of + 1, but in two of + 2. Five of them showed other signs of glaucoma and five did not. Of the latter, four had good vision and one p 1 only. Of the five former only one had p 1 (see below), the rest being blind. One of them, however, had had good sight for twelve years, and had only had glaucoma and loss of sight for four months, while the fellow eye still had good vision twelve years after couching, though with T-2.

Three other couched eyes (not included in the above) had normal tension themselves, but their fellow eyes had glaucoma (coming on ten and thirteen years after the couching operation), for the treatment of which the patients came. As all three had good sight in the couched eye, there was no reason to suppose that this had been glaucomatous when couched, or that the connection was anything but accidental. The case included above as one with glaucoma and p 1 remaining was the only one in the series in which the appearances and history made it probable that the "suttya" had couched for glaucoma and not cataract. Both eyes were glaucomatous, though only one had been couched.

(2) *Decrease* was found in fourteen eyes, eight of which had good vision, two p 1, and four none. Nine eyes had—1, three—2, and two—3, one in the last group giving $V = \frac{1}{8}$, and one being blind.

(6) *Influence of Couching upon Subsequent Extraction in the Fellow Eye*—Thirty-five extractions of cataracts were performed in eyes whose fellows had been couched with the following result: twenty-seven eyes obtained good vision, three p 1, and five no vision. This high proportion of failures—22.85 per cent.—compared with the proportion met with in other extractions (6.82 per cent.)* is noticeable. The failures in the extractions occurred chiefly in patients with couching failures, and it seems just as likely that the cause lay in some constitutional condition of the patient as in any evil influence of the previous couching.

(7) *Twice attempts were made to remove lenses that had been couched*. The sight had begun to fail, and the patients urged that something should be done to prevent it getting steadily worse, as it almost invariably does when once it begins to fail. One case was successful, the other failed. It may be justifiable to attempt the removal of a recently couched lens. If not recent, and more especially if the lens is fixed, it is wiser to leave it alone even if the sight is failing.

CASE 1.—In 1894, man, aged 60, both lenses couched twelve years previously. R E lens fixed low down in vitreous. V = counted fingers well. L E lens behind and adherent to iris, partly obstructing pupil. V = first counted fingers. Removed by ring scoop after escape of vitreous. He obtained good vision.

CASE 2.—In 1899, man, aged 55, both eyes couched one and a half years previously. V = $\frac{1}{2}$ with glasses in each eye, but patient stated that his left eye was failing, and he could not see at night, its tension was + $\frac{1}{2}$. At the operation vitreous escaped at once in small quantity, lens was caught by ring scoop, but found too firmly fixed to move and the attempt caused much pain. It was left. Final results = $\frac{1}{2}$ in the left eye. A fortunate ending.

General Remarks—The broad result brought out by these cases is that twenty-nine out of sixty-three cases of depression, or 46 per cent., retained good vision after an average interval of nearly five years. Two influences weaken the value of these figures, though in opposite directions. Couchers sometimes depress simple chronic glaucomatous eyes, mistaking or not caring about the disease for which they operate. Only one of this series appeared to have had glaucoma when couched. On the other hand, the results are probably better than these figures indicate, because only those dissatisfied with their couched eyes are likely to come for extraction of the other. Of thirty-five so coming thirteen had good vision in the couched eye and twenty-three had p 1 or no vision (eleven p 1, eight nil, and four shrunken globes). Himby, quoted by Power, had ninety-six per cent. successes in 1843.

REFERENCES

- * Power, *British Medical Journal*, 1901, p. 1260.
- † Drake Brockman, *Trans Ophth Soc*, Vol. XV.
- ‡ Maynard, *Indian Medical Gazette*, June, 1901.
- § *Ibid*, loc. cit.
- ¶ Power, *Ophthalmic Review*, Vol. XXI, p. 76.
- ‡ Ischreyt, *Ophthalmic Review*, Vol. XXI, p. 131.

Note—The cases for which Mr. Power considered that depression might prove suitable be classified thus—

- (1) In very feeble and infirm persons, in whom a wound might perhaps not heal at all.
- (2) In very deeply set eyes with narrow palpebral fissures, or in which some similar mechanical difficulty in the way of a good extraction operation exists.
- (3) In chronic conjunctivitis which refuses to yield to treatment, and in the presence of dacryocystitis.
- (4) In extreme deafness, for the patient is less likely to do himself harm at the operation and after if depression is performed.
- (5) In patients of unsound mind or mental deficiency.
- (6) In fat, flabby and phlegmatic patients, for these especially if gouty—do not stand operation well.
- (7) In presence of chronic bronchitis with much coughing.
- (8) If there are complications, such as tremulous iris, fluid vitreous, &c., for sometimes after an incision in such an eye, the vitreous drains away and the eye shrinks completely.
- (9) When the other eye has been subjected to extraction and has been lost.
- (10) In the extremely rare condition of the hæmorrhagic diathesis.

Previous iritis, with adhesion of the iris to the capsule of the lens, must be considered a prohibitive obstacle.

[We invite further discussion. Of course no one now days dreams of advocating the old operation in place of extraction for ordinary cases. The point is: Is couching ever a useful operation? More observations with examinations of the eyes now wanted on cases of couched lenses. Every one has seen dozens of bad results, but an examination of those with good results (such as those detailed in the paper above quoted) would be interesting and useful.—Ed., I. M. G.]

The *advantages* of depoppression are the immediate vision, short confinement to bed, absence of any wound to gape if it heals slowly, lessened danger of sepsis, prolapsed iris or vitreous, intraocular hemorrhage, and finally the absence of astigmatism, and the normal appearance of the eye in successful cases.

The *disadvantages*, considered apart from the high percentage of lost eyes, are the vomiting and inflammation that often occur at, or soon after, the operation, fairly commonly, even in cases that eventually do well according to patients' statements, the irido cyclitis, chronic glaucoma, and some times gradual loss of vision without recognisable organic change, which not infrequently occurs in unsuccessful cases.

Weighing these considerations carefully, one cannot help agreeing with Mr. Power in his conclusion that *under certain circumstances* it "would be at least allowable, if not advisable, to revert to the ancient method of 'depression' for the restoration of light in cases of cataract."

The chief circumstances mentioned by Mr. Power have been recently given in your columns² and need not be reproduced here.

I was able to send over to Mr. Parsons an eye enucleated for glaucoma following upon couching, as apparently there are only on record thirteen instances of such an examination, his report is of much interest.

The clinical notes of the case are —

Mallum Soo, male, aged 55, left eye removed on November 2nd, 1901, for increased tension, iritis, hypopyum, &c., following "couching" by a quack, done one year ago. Patient saw well for a few months, but has had pain, redness and lachrymation for five months. Right eye has ripe cataract, and is watering a little, but is not injected. Eye hardened in 10 per cent. formal for twenty-four hours then in 50 per cent. spirit.

PATHOLOGICAL REPORT

The eye was frozen after removal of the spirit and divided by a horizontal section.

Microscopic Examination — *Cornea* transparent, somewhat collapsed. *A c* full of albuminous coagulum. *Iris* discoloured, pupil small filled with dense exudate, which passes forward as a pyramidal mass into the *a c*, the apex touching the posterior surface of the cornea. *Lens* dislocated, lying firmly fixed upon the ciliary body to the lower and inner side. It is shrunken, probably only the nucleus remaining. It is embedded in exudate, which stretches in all directions through the vitreous. *Retina in situ*, except that it is drawn up slightly into small folds radiating from the lens. *Choroid in situ*.

Microscopical Examination (of upper half) — *Conjunctiva* intensely congested and infiltrated with round cells. *Cornea* shows little abnormality. *A c* full of coagulum containing masses of leucocytes, especially in centre between pupil and cornea. Angles open, but full of coagulum leucocytes and pigment cells. Canal of Schlemm open. *Iris*, marked iritis, the stroma is infiltrated throughout with leucocytes, which in places form closely packed nodules. *Ciliary body* similarly infiltrated. The ciliary processes are somewhat atrophied, and are covered with scattered leucocytes, which are found throughout the vitreous. *Retina*, much degenerated, the rods and cones have everywhere disappeared, the other layers are easily distinguishable, but are atrophic. *Optic nerve*, well marked true neuritis. The head of the nerve is much swollen, densely infiltrated and covered by leucocytes. The vessels are dilated and engorged. A strand of fibrous tissue stretches forwards from the centre of the disc into the vitreous, probably being a remnant of the hyaloid artery. *Choroid*, vessels dilated and full of blood, not much infiltration. deeply pigmented, probably the normal for a Hindu.

THE COLONIAL MEDICAL SERVICE

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—As the appended statement of facts appears to me to affect the I M S and R A M C I would ask you—provided you take a similar view of the situation—to give it all the publicity at your command in the interests of the Profession generally.

In June next the position of Medical Officer to the Malay States Guides will fall vacant. The position having hitherto been held by an official who does not hold any registrable qualification.

It is proposed now to appoint a properly qualified surgeon and physician.

I have had eight years' service in the Civil Medical Department in these States, no increase of pay for 3 years and have recently been asked to accept the post on my present salary, £405 per annum (paid in Straits dollars).

On the grounds that I should thereby be guilty of "under cutting" my professional brethren in the I M S and R A M C, the salary of an officer in charge of a regiment in India being after seven years' service £520 per annum with a horse allowance (vide *Indian Medical Gazette*, December 1904) if a cavalry regiment, I have asked that a "material increase" upon my present salary be offered before I shall be in a position to consider the matter—having due regard to the salary and position granted to my peers in the profession in India.

The regiment numbers 971 strong with women and children.

I shall be deeply obliged if you will let me know as soon as possible what the I M S considers the lowest salary which I ought reasonably to accept as I have specified the present offer as an "undigested Government economy at my expense," in which statement I believe I shall have the sympathy of the Indian Medical Officials.

I am, Sir,

Yours very truly,

P N GERRARD, M.D. (DUB.),

D T M (Cantab, etc., etc.)

P S—I have carefully avoided entering upon the subject of the miserable pay and prospects in the I M S Medical Department as several memorials have been forwarded on the subject to the Secretary of State for the Colonies, besides which "that is another story."

SANITATION IN INDIA

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In calling attention of the Medical Authorities of India I must begin with a word or two about myself, is that I cannot claim to be a specialist in medical department, or well experienced in medical science, but my few years' service as a Civil Hospital Assistant taught me the deficiency of the sanitation of India, as I have been appointed by the Inspector General of Civil Hospitals, Bengal, in 1899 to serve in epidemic and have been deputed to Bhagalpur Division. But how far I have succeeded in this direction and for my new system will be the test of the Medical Committee scrutiny, is a question for the appreciative Medical Committee to judge and decide.

My attempt is to show the deficiencies before the Medical Committee of the present system of the sanitation and to recommend for new system as I have mentioned below, it will be useful both to the Government of India and its subjects.

How does the report of the epidemic reach the Civil Surgeon of the district, and how is medical aid sent there by the present system?

The village chowkidar reports the cases of death of his village after a week or fortnight or in some places after a month to the police station on his parade day. This report from the officer in charge of the police station is sent to the police inspector, and from latter mentioned officer to the District Superintendent of Police through the Subdivisional Officer. Then the District Superintendent of Police will forward all the epidemic forms to the Civil Surgeon. The epidemic report marches in such a tortuous manner that it takes a month or more to reach the Civil Surgeon. The Civil Surgeon will manage to depute a Civil Hospital Assistant to the affected area, if a spare officer is under him or otherwise will telegram to the Inspector General of Civil Hospitals or advertise to the local papers, or will send a notice to the Medical schools for temporary appointment. The Civil Hospital Assistant who is engaged for epidemic will report first to the Civil Surgeon of the district, where he will be supplied with medicines and some instructions, then he will proceed to the subdivision and he will give his arrival report to the Subdivisional Officer from there to the police station where chowkidar reported the cases of epidemic.

It is my own experience that I have been deputed several times and found epidemic had finished its work and preyed hundreds of human life in such a period and set aside or, on the other hand, it furiously prevailed in such area that it would be impossible for a medical man to check it. Though the Sub Inspector of vaccination is permanently quartered in that subdivision, he has no concern in epidemic except to see the operation of the vaccination. He does not know even to treat the cases of the small-pox. I remember here a case which will be interesting to the Medical Committee that on one day was a gathering in one place of vaccinated children to see their operation, a poor old man complained to the Inspector of Vaccination that on the negligence of the vaccinator his child died. In hearing such a word the Inspector and his subordinates make a loud noise and told the poor fellow that "you are a fool" that the child cannot die from the operation. In reality the child died from the complication of the erysipelas. Therefore, I recommend here a new system for the vaccination.

In the place of vaccinator, a pressed compounder should be appointed in each police station according to the population. He should be trained to treat the few epidemic diseases, such as cholera, plague, small pox and malarial fever, etc., and the method of disinfection. He will work as a vaccinator in season time, verify the death and birth registers of the village chowkidars. He should be supplied with a stock of medicines to take the necessary step on receiving the information of the epidemic within his jurisdiction until arrival of the Sub Inspector of Sanitation. The pay of this officer should be Rs. 20 per month.

A Sub Inspector of Sanitation should be appointed from the Civil Hospital Assistant class and to be posted in each subdivision in place of the Sub Inspector of Vaccination. He will take necessary step to check the epidemic and inspect the work of his subordinates. He will also advise the villagers to adopt the sanitary precaution in their village. The pay of this officer should be begun from Rs. 50 per month.

An Inspector of Sanitation or Assistant Health Officer should be appointed from the Assistant Surgeon's class or from the senior grade of the Civil Hospital Assistant class on their merit to take necessary steps in epidemic of the district, and to inspect the bazar food and to assist the Civil Surgeon and to inspect the work of his subordinates, both in sanitation and vaccination. His pay should be from Rs. 150 and 100 respectively to his class in the place of the Inspector of Vaccination.

I have the honour to be,

Sir,

Your most obedient servant,

BASHARAT HUSAIN,

CIVIL HOSPITAL ASST.,

April, 1905

Jagannathpura, Singbhum District

Service Notes.

WE quote the following very interesting extracts from a paper by Major L. L. Seaman, U. S. Army (*Journal of the American Medical Association*, January 1905) —

"On July 1st, our long delayed passes came, permitting us to visit all the Military and Naval Hospitals in Japan, and the Russian wounded and prisoners at Matsuyama. No time was lost in turning at once to Hiroshima on the beautiful Inland Sea, where the Reserve Hospitals are located. These institutions comprise six divisions, in different parts of the city, each division having its own administrative building, behind which a long open hall runs between ten corridor wards. Each ward is capable of accommodating fifty patients in ordinary times, but such is the elasticity of the hospital, that in the emergency of war 500 extra beds can find temporary space in each division. Fifteen Buddhist temples have recently been requisitioned, to form an additional division, their beautiful and roomy interiors giving ample accommodation for another 1,000 patients. Hundreds of wounded arrive every few days from the fields around Port Arthur where terrific fighting has been in progress almost incessantly since July 15th. Since August 26th (after which I made a second visit to Hiroshima) the execution has been at much closer range, and the severity of the wounds correspondingly increased. High velocity bullets at such short distances produce an almost explosive effect, shattering osseous and lacerating muscular tissue far more than any previously brought from the front.

The operating room of the first Division Reserve Hospital is presided over by the distinguished Surgeon General Sato, and his able associates, Colonel Ohnishi and Captain Tanaka. Here indeed was the surgery of the battlefield, for gunshot casualties of nearly every conceivable type were continually arriving from the front. A detailed description of even a few of them would be impossible in the prescribed limits of this paper, but the careful systematic work of the attending surgeons and Red Cross and American nurses call for special commendation. One of the features of the Hospital is the constant flooding of the floors of operating and dressing rooms with a solution of bichloride, to prevent dust or the development of bacteria.

Of the thousands of casualties here, the most interesting from the Surgeon's standpoint were those of spurious and traumatic aneurism, of which I saw 26. These cases were comparatively rare before the introduction of the modern small bore metal jacketed bullet of high velocity, the theory of their causation being that they result from the initial energy imparted to the soft structures near the injured vessel (or to the vessel itself) at the instant of the impact of the bullet. This force or energy, *vis a tergo*, as it might be termed, lacerating and contusing the adjacent soft structures in its course, also injures the elastic layer of the arterial wall, so that, sometimes weeks after the original wounds of entrance

and exit have healed, a small pulsating tumor is discovered, near the track of the bullet, which, distending gradually, soon becomes an aneurism requiring operative interference. Such a specimen is shown in the bottle before you. It resulted from a bullet passing through the middle third of the forearm nearly half an inch from the radial artery. The wall of the vessel was injured so that it lost its resisting power, and the aneurism gradually developed three weeks later.

The ideal treatment adopted is to control the circulation, cut down upon the tumor, ligate the proximal and distal ends of the artery, and enucleate or dissect it out.

In traumatic aneurisms this method is rarely possible, owing to extensive blood extravasations, and the friability of the surrounding tissue more or less broken down by the distention caused by the presence of old blood clots. The muscles of the soldier are firm and tense, and contract or relax in their sheaths so easily, as often to occlude the small apertures made by the entrance and exit of the modern ball. If then a small artery is cut along the track of the bullet, and the overlying muscles prevent the escape of the resulting hemorrhage, a traumatic aneurism follows, whose size depends upon the calibre of the injured vessel, and the resistance of the surrounding tissue. Extensive extravasation may take place between the sheaths of muscles, as was the case in two instances I saw, where large coagula were turned out after incisions, and where in one case, amputation was necessary to control hemorrhage and save life. Pulsation of the tumor is rarely felt, owing to coagulation of the effused blood, or the small size of the affected vessel.

Another series of interesting cases of which there were numbers in the Hospital, were those in which the bullet had injured both a vein and an artery, or where both vessels had been simultaneously punctured, resulting in a direct or indirect connection of the vessels, or, in other words, an arterio venous communication. In one of the cases (when I was present at the operation) the radial artery was affected — an aneurismal sac had formed in which the bruit and pulsation were distinctly marked. Ligatures were applied to both ends of the artery, its sac and connecting link with a section of the vein carefully removed, and, as I learned afterwards, the patient had a rapid and satisfactory convalescence.

Instances I saw of bullets passing directly through the great cavities — 7 through the cranium, 9 through the thoracic, 8 through the abdominal, and so many through the extremities that their number was quite lost, cauterizing their course, and healing both entrance and exit wounds by first intention after first-aid dressings were so numerous as to leave no doubt as to the asepsis of the modern ball when the lesion is uncomplicated. Of course suppuration followed where balls ricocheted, carrying with them foreign matter, bits of clothing, dirt or splinters, but these instances were comparatively rare, and only served to emphasize the wisdom of the principle of non-operative interference on the field, or after wards, except under strict aseptic conditions, a principle the Japanese fully appreciate, and the adoption of which has saved many valuable lives.

Conspicuous by their absence were cases requiring operations for appendicitis, hernias, floating kidneys, cholecystomies, etc. Indeed, during the entire summer I have not seen a single hernia or a laparotomy. The Japanese soldier has been taught how to treat his intestines, and consequently his intestines are now treating him with equal consideration. His plain rational diet is digested — metabolized and assimilated. It is not an irritating indigestible fermenting mess — acting as a local irritant and producing gastritis, duodenitis, enteritis, colitis, hepatitis and the long list of inflammatory intestinal processes with which we were all so familiar in the hospital wards at Camp Alger, Chattanooga, Tampa, Cuba, Porto Rico, Montauk Point, etc., in 1898.

Indeed, the men here looked remarkably strong considering their trials — far more so than the wan, but courageous Tanaka whom I saw again in September with an infected finger, and a temperature ranging above 100° F., but who nevertheless was at that time doing his 10 to 12 capital operations a day.

As for the average Japanese soldier, he is either less sensitive or more of a stoic than the rest of humanity. On the entrance of a surgeon, if able to stand, he is instantly at "attention," if too ill, he crosses his legs in his cot in the graceful pose of his Buddha, and remains in that attitude until the visit is over. I have seen many a long ward full of these victims of Russian shot and shell, sitting like rows of Buddhist statues, with the same immobile look of quiet restfulness — of peaceful contentment, that characterizes their great philosopher — recalling in more ways than one the great exponent of their faith, and in voluntarily it inspires a respect and admiration, not far from reverence, for these silent suffering men who never complain, but who do their duty, regardless whether the end be victory or oblivion.

Our next visit was to Ujina, the port of Hiroshima, where the Red Cross Hospital Ship *Hakuyō Maru* was preparing to leave on her sixth voyage to the front. Though the courtesy of her commander, Captain Sekina, and her administrative officer, M. Kikawa and the Medical Staff, we made a thorough inspection of the ship in every department. She

has ample accommodations for 200 wounded, which in emergency can be increased to 300—and in every feature—even to operating room and room for radiography, she compares favourably with the best ships used for similar purposes by the English, German and American Armies.

Next we visited Kure, one of the naval bases, and thence, to Matsuyama, where the Russian prisoners, 1,600 in number, were being entertained. I say entertained—for there was nothing about their surroundings to suggest the idea of a prison, and the men themselves (excepting the officers) seemed to be having the time of their lives. They were all from White Russia—mostly Finns and Poles with a decided sprinkling of the Children of Israel in evidence. Pondering on the recent monstrous atrocities at Kishinev, and beautiful Helmsfors, and the woes of these people in their own unhappy land, the thought occurred that His Imperial Majesty the Tzar of all the Russias was emulating, with emphasis, the illustrious example of David of old with Uriah, in sending these people as cannon fodder to the Orient, where the more killed the better, for the safety of the throne at home. The officers were quartered in a magnificent Buddhist Temple in a wooded park, near a crystal lake where many tailed gold fish sported under the lotus and the iris, and century old cryptomeria cast their graceful shadows over the scene of beauty. The wounded also, of whom there were over 500, had commodious accommodation, and looked well fed and happy. At the conclusion of our visit the common soldiers shouted their familiar salute, as it is given to their officers,—and as I had often heard it in years gone by in their camps in Port Arthur. The men are solid, thick set, well built fellows, capable of great physical endurance, heavier and but little taller than their Japanese antagonist—except the officers who are all large, handsome fellows, splendidly developed. The customary ration of the Russian soldiers consists of as much good hot broth or soup as they care to eat, made principally of vegetables with a few bones or a bit of meat thrown in, and a loaf of black rye bread, so hard and sour that one wonders how they can chew it but the Japanese are feeding them more liberally, with fish, white bread, fruit and many added delicacies, and several of them, speaking in German, declared to me that they hoped to be left in Japan forever.

From Matsuyama we proceeded to Shimonoseki (historic from its association with the signing of the treaty of peace by the Viceroy of China, Li Hung Chang, and the Emperor of Japan, in 1895) to Sasebo, the invulnerable base of the Japanese Navy. This is a most picturesque and remarkable Port, 20 miles from the sea, so securely hidden among the mountains that no hostile fleet could ever hope to follow its tortuous channel of approach, without danger of utter annihilation. Its dry docks are among the largest in the world, and its enormous arsenal, a perfect beehive of industry. Three hundred vessels of war,—transports, torpedo flotillas, destroyers, cruisers and battleships,—were gathered here at the outbreak of hostilities, and here, too, on a shaded eminence, overlooking the harbor (which in beauty resembles a Swiss mountain lake) is the chief Naval Base Hospital, with Surgeon General K. Totsuka, F.R.C.S., in charge. In times of peace, the ordinary staff of the Hospital, like that of the Kure Port Admiralty, consists of six surgeons, a pharmacist, and thirty nurses, but in the emergency of war it can be increased as occasion demands.

The character of the cases found here differs widely from those in the Military Hospitals, being of a type distinctly more severe. This can better be appreciated when it is known that prior to the date of our visit—July 16th—the total casualties in the Navy amounted to 1,429, of which 1,209 were fatalities. But such statistics are misleading unless it is remembered that over 500 of these deaths occurred on the occasion of the torpedoing of the ill fated battleship *Hatsuse*, and a large proportion of the remainder on the ships that were exploded or sunk in the futile attempts to blockade the narrow channel to Port Arthur. Less than 200 wounded had been rescued from these terrible tragedies and forwarded to Kure and Sasebo. Indeed, 225 represents the total number of casualties thus far received at these institutions, and of these, only five have died. The remainder are rapidly convalescing notwithstanding their terrible punishments.

Casualties in Naval warfare differ radically from those in land battles in that bullets are rarely a causative factor in one, whilst in the other they are the predominating cause. Fragments, shell, ragged and twisted bits of metal and splinters, causing fearful lacerations, contusions, with compound and compound comminuted fractures, abrasions, burns from explosives, scalds from escaping steam, penetrating, or perforating wounds of the cranial, thoracic or abdominal cavities predominate here. These are all liberally represented in the wards at Sasebo, and, as at Hiroshima, the most improved methods of treatment are in vogue and with the most flattering results. But one patient in the entire hospital presented an unfavorable prognosis, and he was suffering from tubercle, and had not been in the front. Many of the cases were those picked up by the torpedo boats after the terrible mine explosion under the *Hatsuse*, and these taken from the

water after the sinking of the ships in the Port Arthur Channel—most of them had been blown from their ships, and, rescued by the torpedo boats under a hail of fire, and with the greatest difficulty. The men all look vigorous and happy. They are gaining weight under their enforced idleness, and like them follows in the other branch of the service, their first question is to learn when they may return to their posts of duty.

Surgeon General K. Totsuka, to whom I am indebted for many delightful courtesies, is a gentleman of rare ability and practical ideas. His chief assistant, Fleet Surgeon K. Habuto, through whose generosity you are permitted to see the photographs before you, and Dr. H. Sonobe, are able seconds. One of the practical inventions of Surgeon General Totsuka, is the bamboo winging scatcher used throughout the Japanese Navy. He kindly permitted me to purchase one from the Hospital Stores, which I shall have the pleasure of showing you later.

I have seen the effect of some of the famous Shimose powder. This compound is not used for killing propulsion I mean, i.e., for loading cartridges, but for its explosive qualities in blowing up ships and in loading shells. As an evidence of its power of fragmentation, the case of a Russian blue jacket may be cited. He was on the Cruiser *Variag* in the Chemulpo fight when a Shimose shell burst near him. An examination of his body disclosed the presence of 161 distinct wounds.

I have tried to tell you something of the surgery of the war, but no reference has yet been made to the Medical Wards of the great Hospitals. They are three—internal, contagious and infectious departments—their conspicuously empty beds voicing more eloquently than words, the most important lesson of the war. A few cases of diseases of the respiratory system are found—colds, bronchitis, and an occasional pneumonia,—contracted through exposure in fording rivers, exhaustive marches, and bivouacking on wet ground, a few more of typhoid (I saw only three in Manchuria), occasionally one of dysentery,—indicating the constant presence of these dangerous germs in the fighting zone (where among the natives—Koreans, Chinese—no more provision is made for sanitation than in an ordinary farmer's pig pen), and a number of cases of Kakkī—beriberi—that former scourge of Oriental armies. But of all the many thousands gathered in these institutions there were but a few medical cases—and of these scarcely a baker's dozen came under the heading of diseases of the digestive system. Therein lies the great secret of the Japanese success. Napoleon never made a more truthful statement than when he said "An army fights on its belly." Yea, verily, and the Japanese have that belly, and they take good care to keep it in fighting order—not by insulting it three times a day by cramming it with material totally unsuited to the soldier's necessities, thereby exciting irritations and disease, but by supplying it with a plain, palatable, easily prepared and easily digested ration that can be thoroughly metabolized and converted into the health and energy that makes its owner the ideal fighting machine of the world to day. The ration used by the Navy leaves little to be desired. I have seen entire crews on those rolling porpoises of torpedo boats, after six months' continuous duty, stronger and heavier than when they entered the service, when in our own Navy, or in that of Great Britain, an uninterrupted detail of this duration and character is considered about enough to put a man out of business.

Internal diseases are practically an insignificant factor in the Naval Hospitals, and up to July 20th not a single case of Kakkī had developed. This excruciatingly painful disease, known in the literature of the Orient since the days of Confucius, was for centuries the dread of Oriental armies. Nor were the navies exempt, for as late as 1882 in the total force of 4,769 in the Japanese service, 1,929 suffered from Kakkī, of whom 51 died. Elaborate investigation was instituted by Dr. Takaki, then Medical Director of the Admiralty, resulting in the establishment of the fact that Kakkī or beriberi is a neurotic disorder resulting from a lack of nitrogenous nutrition—in other words, of nerve starvation. The ration was remedied, to supply the lacking elements, with the result of practically eliminating it from the diseases treated in the hospitals of the Admiralty. From 1888 to 1893 not a single case developed. But the Army is less fortunate than the Navy. Its ration is not so rich in nitrogen. Economy is a factor that had to be studied most carefully, in Japan, and so no variation was made in the old ration of the soldier. This proved satisfactory in time of peace, when the soldier was not bound to it so rigidly as when in foreign service and even in the first six months of the present conflict it served its purpose, but the long unbroken marches, when for weeks men were reduced to two meals a day—the terrible fighting in one instance—with no interruption for seven days—during three of which a large part of the Army had almost nothing to eat, and but little to drink the long nervous tension and deficient nutrition began to tell, and when I left Newchwang late in August, Kakkī began showing itself in the ranks. It is to be hoped that the reported capture by Japanese of sufficient provisions at

Laoying to last the entire army three years is true—in which overt Kakki will soon disappear. If not, the sooner the authorities substitute barley or lentils for a portion of the rice allowance, and a little pemmican as formerly used by our own army, biltong, used by the Boers, or pea sausage as used by the Germans—and by Kitchener in his famous campaign to Kbartoum—the better it will be for their welfare. These foods will supply necessary deficiencies and banish an enemy that is second only to the foe they are trouncing so beautifully in the field.

It may be here incidentally noted, that the ration table of the Japanese blue jacket contains a daily allowance of 3 oz of liquor—saki—which, to quote from the report of Baron Saneyoshi, Director General of Medicine of the Imperial Japanese Navy, after "exposure to severe cold, or heavy rain, stimulates the action of the skin and is a great preventive against catching cold, after severe labor re-creates strength, and when the digestive power is dull during the hot season, and the heart gets weakened, is a stimulant. It also raises the spirits and gives hilarity when on lonely expeditions, and many other benefits can be obtained from the use of liquors. A small number of medical men consider that harm results from it, i.e., excessive radiation of bodily heat consequent on the dilatation of blood vessels of the skin, weakening of the resistive power of the body, neglect of work through drunkenness, and baneful effects on the digestive organs and the mind. From these ill effects we are pleased to say that none of our men suffered." During voyages in stormy weather, after rowing in rough water, cooling, fighting, and in severe cold below zero, and at the time of sentinel duty in the dead of winter, six ounces of saki, or one ounce of spirits (rum or brandy) is officially given. It can also be obtained in the canteen in limited quantity (6 ounces) under strict regulations. And yet Japan is a land of comparative temperance where I have never seen a man in the service or out of it, under the influence of liquor. Like every other army in the world, except the Chinese and American, the Japanese have a well regulated army canteen where beer is dispensed under official supervision. This beverage is recognized as bread in solution, an excellent food, that has undergone fermentation, thereby saving the stomach the unnecessary labor of acidulating it in the process of digestion. The officers regret that beer cannot be supplied to their men in Manchuria as a component of their daily ration, and in this, I believe, they are perfectly right.

The organization of the Medical Department of the Japanese Army and Navy is modelled after that of the Germans, with many added improvements. In the Army, Director General Koike, with his Associates, Dr Hashimoto, Surgeon-General at Tokio, Dr Sato, Surgeon-General at Hiroshima, and Dr Kikushi, Surgeon-General at Osaka, together with a Surgeon General with each of the three armies in the field, all have the rank and emoluments of Major General.

In the Navy, the Director General, Baron Saneyoshi, has the equivalent rank of Lieutenant General, whilst his principal associates, Dr Totsuka, Surgeon General of the Sasebo Port Admiralty, and Dr Suzuki, Surgeon General of the Kure Port Admiralty, rank as Major Generals.

All of these officers both in Army and Navy are of one or more grades higher than the highest possible rank attainable in our army, namely—our Surgeon General, who ranks only as a Brigadier General.

In peace time the head-quarters medical personnel of each division consists of 1 principal surgeon, 2 surgeons and 9 medical subordinates. At the head quarters of each division is a well equipped garrison hospital, and local hospital arrangements are made at out stations, each hospital being provided with a suitable proportion of medical officers, apothecaries, and medical subordinates. The Red Cross Society has a central Association in Tokio, with a branch in every "Ken" or prefecture. It is in a very flourishing condition, and its list of membership now includes over a million names. Its agents and nurses, of whom there are thousands, are subject to military control, and work in perfect harmony with the Medical Department.

Too much praise cannot be bestowed upon the Medical Departments of the Army and Navy for their splendid preparatory work in this war. The Japanese are the first to recognize the true value of an Army Medical Corps. Care of the sick and wounded consumes but a small part of their time. The solution of the greater problem, preserving the health and fighting value of the Army in the field—by preventing disease, by careful supervision of the smallest details subsisting, clothing and sheltering the units,—is their first and most important duty. Their capacity for detail is something phenomenal, nothing seems too small to escape their vigilance or too tedious to weary their patience, and everywhere—in the field with the scouts, or in the base hospitals at home—the one great prevailing idea is the prevention of disease. The Medical Officer is omnipresent. You will find him in countless places where in an American or British Army he has no place. He is as much at the front as in the rear. He is with

the first screen of scouts with his microscope and chemicals, testing and labelling wells so the army to follow shall drink no contaminated water. When the scouts reach a town, he immediately institutes a thorough examination of its sanitary condition, and if contagion or infection is found, he quarantines, and places a guard around the dangerous district. Notices are posted, so the approaching column is warned, and no soldiers are billeted where danger exists. Microscopic blood tests are made in all fever cases, and bacteriological experts, fully equipped, form part of the Staff of every Divisional Head quarters.

The Medical Officer also accompanies foraging parties, and with the commissariat officers samples the various food, fruit and vegetables sold by the natives along the line of march, long before the arrival of the army. If the food is tainted or the fruit over ripe, or the water requires boiling, notice is posted to that effect, and such is the respect and discipline of every soldier from commanding officer to the file in the ranks, that obedience to its order is absolute.

The Medical Officer is also found in camp, lecturing the men on Sanitation, and the hundred and one details of personal hygiene,—how to cook, to eat, and when not to drink, to bathe, and even to the direction of the paring and cleansing of the finger nails to prevent danger from bacteria. Long before the outbreak of hostilities he was with the advance agents of the army, testing provisions that were being collected for troops that were to follow—and as a consequence of these precautions, he is not now found treating thousands of cases of intestinal diseases, diarrhoeas or dysenteries, contagion and fevers that follow improper subsistence and neglected sanitation,—diseases that have brought more campaigns to disastrous terminations than the strategies of opposing generals or the bullets of their followers.

It is much too early to submit statistical proof, but from careful observation I venture to predict the records of the Japanese hospitals will show a large reduction in the percentage of mortality from casualties, especially in penetrating wounds of the skull, chest and abdomen, and injuries to osseous structures—indeed of every variety of wounds, except perhaps those of the spinal cord, when compared with the statistics of former wars. Up to August 1st, 9,562 cases had been received at the Reserve Hospital at Hiroshima, of whom 6,636 were wounded. Of the entire number up to that time, only 34 had died.

To July 20th, the Hospital Ship *Hakui Maru* alone, brought 2,406 casualties from the front without losing a single case in transit. Up to July 1st, 1—10 wounded—a large proportion of whom were stretcher cases, were received at the Hospitals in Tokio—none died, and all but one presented favorable prognosis. It is upon this, and much additional ocular evidence that cannot be here tabulated, that the prediction is based. A contributing factor to this happy result has been the application of the principle of non interference, by probe or otherwise, except by first-aid dressings or immobilization of limbs on the battlefield, and the thorough antiseptic methods in after-treatment.

But it is in that far more terrible and pathetic class of losses—the needless sacrifice of 400 lives to preventable disease, for 100 who die legitimately (as history has shown occurs in every war) that the most astounding reduction will be shown. If the testimony of those conversant with the facts can be accepted, supplemented by my own limited observations, the loss from preventable disease in the first six months of this terrible conflict will be but a fraction of one per cent. This, too, in a country notoriously unsanitary. Compare this with the fearful losses of the British from preventable disease in South Africa—or worse—with our own losses in the Spanish American War—where in a campaign the actual hostilities of which lasted six weeks the mortality from bullets and wounds was 268, whilst that from disease reached the appalling number of 3,862, or about 14 to 1, or 70 per cent, one per cent against 70 per cent.

Regardless of the ultimate outcome of this terrible war, history will never again furnish a more convincing demonstration of the benefit of Medical, Sanitary and Commissariat Departments, thoroughly organized, equipped and empowered to overcome the silent foe.

Every death from preventable disease is an insult to the intelligence of the age. When it occurs in an army, where the units are compelled to submit to discipline, it becomes a governmental crime. Witness the French campaign in Madagascar in 1894 where, of the 15,000 men sent to the front, 29 were killed in action and over 7,000 died en route, to and from the scene, from preventable causes.

The Japanese do their killing, but they do it differently. They too have their tragedies, but they are legitimate tragedies of grim war, not governmental murders through criminal neglect. By the methods, I have faintly described their recognition of the importance of preventive Medicine and Sanitary and Commissariat supervision, they have doubled the fighting efficiency of their army, and reduced to a minimum the loss from preventable disease.

Naturally one asks—were these results anticipated? As an answer, the statement of a distinguished Japanese officer,

when discussing with me the subject of Russia's overwhelming numbers, is pertinent "Yes," he said, "we are prepared for that Russia may be able to place 2,000,000 men in the field. We can furnish 500,000. You know in every war 4 men die of disease for every one who falls from bullets. That will be the position of Russia in this war. We propose to eliminate disease as a factor. Every man who dies in our army must fall on the field of battle. In this way we shall neutralize the superiority of Russian numbers and stand on a comparatively equal footing."

Compare this with the attitude of Russian officials in the Far East as stated by Captain Gunderson, Russian Commander of the Steamship *Unison*, wrecked off the Mirotau Islands last August as she was attempting to run the blockade at Port Arthur. I was on the wreck three days in company with my friend Captain Boyd, 10th U.S. Cavalry, and Captain Gunderson repeatedly assured us that no one in Russia ever had any idea Japan really intended war. As an evidence he cited a conversation with his brother-in-law, who is the Russian Surgeon-General at Vladivostok, and who said "Oh there will be no war. If Russia expected war I should be the first to know it, so my hospitals could be in readiness. As it is, I have never been so short of supplies as I am to-day. There will be no war." That night Admiral Togo torpedoed the Russian squadron, and practically closed Port Arthur to the outside world.

What was true of the Russian Medical Corps was equally true of every branch of the Russian Service in Manchuria. "There will be no war," echoed the newly arriving officers, and the carnival of revelry that has marked the Muscovite invasion since 1893 was intensified by added numbers. Arriving trains that should have been crowded with men and munitions of war, brought each a full complement of the demi-monde and vodka. The thousands of these creatures and tens of thousands of cases of vodka that passed over the Siberian Railway in place of food and equipments must have horrified even the gentle Verostchagin, familiar as he was with war, in its most brutal and bestial aspects.

THE issue of the *Edinburgh Medical Journal* for January 1905 is a centenary number, celebrating the completion of the *Journal's* hundredth year, and is made up of a series of papers, recounting the advance made in the past century in the various branches of medical science. These papers are contributed by different members of and alumni of the great Edinburgh Medical School, and, naturally enough, have special reference to the progress of medical science as set forth in the *Journal* itself during the last one hundred years. It is a journal which, as a rule, does not contain many contributions from officers in the medical services, but several members or ex-members of the I.M.S. are mentioned, as having made contributions of importance. Those we noticed are as follows—

John Leyden (Madras, 1802-1811), not for medical, but for general literary work (p. 7).

Joseph Fayrer (Bengal, 1850-1874), on aphasia (p. 13), on elephantiasis scroli (p. 33), and on snake poisoning (p. 50).

W. W. Ireland (Bengal, 1850-1861), on idiocy and imbecility (p. 13).

Charles Murchison (Bengal, 1853-1855), on medicine (p. 8), on hydatids of liver (p. 16), on fevers (p. 17), and on pneumonia (p. 20).

George Playfair (Bengal, 1805-1843), on dysentery (p. 50).

James Ranken (Bengal, 1809-1845), on snake poisoning (p. 50).

Curiously enough the name of William Smoult Playfair, a distinguished graduate of Edinburgh, and ex-member of the Bengal Medical Service (1857-1864), and a man who stood at the top of the tree in his own specialty until his death two years ago, is not mentioned. [D. G. C.]

THE services of Major E. R. Parry, I.M.S., are placed at the disposal of the Jail Department of Bengal. Major Parry has gone to Buxar Central Jail, as Superintendent, *vice* Mr. C. Sevenoaks on leave.

MAJOR C. H. MELVILLE, M.B., D.P.H., Royal Army Medical Corps, to be Sanitary Officer, Army Head Quarters, *vice* Lieutenant-Colonel H. S. McGill, Royal Army Medical Corps, vacated.

MAJOR G. RAYMOND, M.B., D.P.H., Royal Army Medical Corps, to be Sanitary Officer, Secunderabad and Burma Divisions, *vice* Major C. H. Melville, D.P.H., M.B., Royal Army Medical Corps, appointed Sanitary Officer, Army Head Quarters.

WITH the approval of the Secretary of State for India, the following revised scale of leave pay for officers of the Indian Medical Service subject to the Leave Rules of 1886 for the Indian Army is sanctioned, in substitution of the rates at

present allowed under Article 759, Army Regulations, India, Volume I, Part I —		£
On appointment		250 a year
On entering 10th year of pension service		300 "
" " 15th " "		450 "
" " 20th " "		600 "
" " 25th " "		700 "
2. The above scale will have effect from the 19th February 1905		

THESE rates, we understand, apply only to Medical Officers, I.M.S., in military employ.

IT will be noted that the leave pay after 20 and 25 years' service, *viz.* £600 and £700 per annum, are very much better than the pensions granted at 20 and 25 years' service.

LIEUTENANT COLONEL G. S. A. RANKING, I.M.S., has applied for a new patent for his invention of an "improved means for releasing boats from their falls at both ends simultaneously."

CAPTAIN C. J. ROBERTSON MILNE, I.M.S., has been appointed to officiate as Superintendent of the Punjab Lunatic Asylum, Lahore, *vice* Major Ewens, on leave.

COLONEL J. DUKE, I.M.S. (ret'd), is bringing out an addendum to his useful little pamphlet on Cholera Prevention, on the treatment of a case of cholera. It has been written in response to requests for information on this point, and is intended for use of laymen in places where no doctor is quickly available.

THE 41 days' privilege leave granted to Captain J. W. Watson, I.M.S., at Turbat and Haidori is cancelled.

CAPTAIN C. B. MCCONAGHY, M.B., I.M.S., is posted as Agency Surgeon and *ex officio* Assistant to the Political Resident in Turkish Arabia.

THE following Lieutenants are promoted Captains, I.M.S., from 29th January 1905—

Alfred Ernest John Lister, M.B., F.R.C.S.
 Thomas Samuel Beauchamp Williams, M.B.
 Samuel Herbert Lee Abbott
 Alexander William Greig
 Richard Ernest Lloyd
 John Edmund Clements, M.B.
 Hugh Barkley Steen, M.B.
 Ernest Bisset, M.B.
 Richard James Bradley, M.B.
 James Woods, M.B.
 Alexander William Overbeck Wright, M.B.
 David Munro, M.B.
 Thomas William Hailey, M.B.
 John William McCoy
 Roger Lionel Hagger
 Robert Markham Carter
 Roger Durrant Willcocks, M.B.
 Thomas George Feigunson Paterson, M.B.
 Dodington George Richard Shurton Baker
 Jasper Robert Joly Tyrrell, M.B.
 Diwan Ganpat Rai
 Robert Macpherson Barrion
 William Reith John Scroggie
 Lewis Patrick Fairall
 Thomas Henry Gloster, M.B.
 Herbert Henry George Knapp, M.D.
 James Henry Horton, D.S.O.
 William Adolphus Justice, M.B.

THE following Captains are promoted Majors, dated 30th January 1905—

Charles Milne
 Vivian Godfrey Drake Brockman
 William Young, M.B.
 John Joseph Bourke, M.B.
 Bernard Robert Chatterton, M.D., F.R.C.S.I.
 Cedric Barkley Prall
 Charles Edward Williams, M.B.
 John Norman MacLeod, M.B., F.R.C.S.E.
 Walter Holland Ogilvie, M.B.
 Thomas Alfred Ollivant Langston
 Richard Heard, M.B.
 Edgar Rowe Parry, M.B.
 Walter Hood Orr
 Paxton St. Clair More, M.B.
 George Bidie, F.R.C.S.E.

IT is notified that officers on the Indian Establishment will receive the Somaliland war gratuity for the recent operations from the India Office on application.

LIEUTENANT COLONEL S C NANDI, I M S, has got leave out of India up till 5th December 1905, pending retirement. He has seen much service on both the North-East and North West Frontiers

MAJOR G F W EWENS, I M S, Superintendent, Punjab Lunatic Asylum, is granted 19 months' combined leave

CAPTAIN E S PECK, I M S, on return from leave, is posted to Lyallpur as Civil Surgeon

MAJOR E WILKINSON, F R C S, I M S, Chief Plague Medical Officer, Punjab, has obtained two years' combined leave

COLONEL RANKING, I M S, for many years Secretary to the Board of Examiners in Oriental Languages, has been appointed Lecturer in Persian at Oxford

CAPTAIN C H S LINCOLN, I M S, has been appointed to act as Civil Surgeon, Bijapur

MAJOR D W SCOTLAND, I M S, has been granted furlough for two years

THE Right Hon'ble the Secretary of State for India has ruled that the promotion to the higher grade of Lt Col in the Indian Medical Service, in place of an officer transferred to temporary half pay, should be permanent, the officer so promoted becoming supernumerary in the event of the other being restored to the effective list.

CAPTAIN HAYWARD, I M S, has been appointed Civil Surgeon of Rajshaye District, *vice* Major B H Deare, I M S, gone on furlough

CAPTAIN J F W RAIT, I M S, is appointed Civil Surgeon of Purnea

CAPTAIN URWIN, I M S, was appointed Civil Surgeon of Dinajpore, but has now rejoined the Calcutta Medical College

DR. W FORSYTH has been granted two months' privilege leave, and Dr W O Hossack has been appointed to act as Health Officer of the Port of Calcutta.

MAJOR J T CALVERT, I M S, has been granted two years' leave out of India, and Major B Oldham, I M S, officiates as Civil Surgeon of Outback and Superintendent of the Medical School

THE new regulations for entrance to the P W Dept of India are contained in the *Gazette of India* for 18th February 1905

CAPTAIN C H S LINCOLN, I M S, M R C S, is granted combined leave from 15th March

LIEUTENANT COLONEL J MAITLAND, M D, I M S, Principal, Medical College, Madras, and Associate Editor of this Gazette, has been obliged to take one year's furlough, on medical certificate, from 27th February 1905

LIEUTENANT COLONEL W B BROWNING, I M S, C I E, officiates as Principal, Medical College, Madras, *vice* Lieutenant-Colonel Maitland, I M S, on furlough

LIEUTENANT COLONEL H THOMSON, I M S, returned from leave on 2nd March 1905

MAJOR F J CRAWFORD, I M S, is posted to the charge of 3rd District, Madras

MAJOR C H L. PALK, I M S, is posted as Civil Surgeon of Ootacamund

CAPTAIN E M ILLINGTON, I M S, is due back from leave on 9th July 1905

CAPTAIN C G WEBSTER, I M S, is due back from leave on 22nd June 1905

The services of Captain E J Morgan, M B, I M S, are placed permanently at the disposal of the Government of the United Provinces

The services of Major E G R. Whitcombe, I M S, are replaced at the disposal of the Commander in Chief

LIEUTENANT W S PATTON, I M S, was temporarily employed on Plague duty from 2nd to 18th February 1905

The services of Lieutenant G F I Harkness, I M S, are placed at the disposal of the Government of Bombay for plague duty from 18th February

The services of Major C T Hudson, I M S, are permanently placed at the disposal of the Bombay Government from 14th March 1903

MAJOR H E DRAKE-BROCKMAN, I M S, is granted combined leave for 14 months and 20 days from 15th February 1905

CAPTAIN R. W KNOX, I M S, is posted as Agency Surgeon in Bundelkhand

On return from furlough Major H Burden, I M S, is posted as Residency Surgeon in Gwalior

LIEUTENANT W S PATTON, M B, I M S, and Lieutenant G F I Harkness, I M S, were both employed on plague duty at Aden during the month of February

CAPTAIN W G RICHARDS, I M S, is due back from furlough on 20th October 1905

THERAPEUTIC NOTES, &c

WE have received a very interesting little book entitled *Thirty five Years at Contrexeville*, by Dr. Deboul D'Estrees of that place. It gives a very good and clear account of the various waters at Contrexeville and their therapeutic uses. It gives a lot of valuable advice on the methods of getting rid of an excess of uric acid, the principal manifestations of which are gravel, gout, gouty diabetes, and eczema.

We commend this little book to our readers, it is published in London by the Health Resorts Bureau, 27, Shoe Lane, E C, and in India is obtainable from Messrs E Seconde & Co the sole agents for the Société des Eaux de Contrexeville, at 1, New China Bazar Street, Calcutta.

THE Sallzogene Patent Chaiques Co., of St Helens, Lancashire, have sent us specimens of their preparation *Sulphagun* or nascent sulphur bath chaises, which are largely used by physicians in the treatment of skin diseases. The sulphur is in an extremely fine state of division. This preparation is one that can be recommended. The proprietors advertise only to the medical profession.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs Thacker, Spink & Co., Calcutta.

Annual Subscriptions to the *Indian Medical Gazette*, Rs 12, including postage, in India Rs 14, including postage abroad.

BOOKS, REPORTS, &c, RECEIVED —

Malaria and Blood Parasites, Stephens and Christophers. 2nd Edition (Williams and Northgate)
The Conjunction in Health and Disease, Bishop Harman (Baillière Tindall & Cox.)
Principles and Practice of Asopsis Vallack (Baillière Tindall & Cox)
Clinical Lectures on Appendicitis and Hernia, C B Turner (Baillière Tindall & Cox)
Surface Anatomy By T G Moorhead
Poisonous Plants, Bernhard Smith (J Wright & Co)
Elementary Microscopy Shillington Seales (Baillière, Tindall & Cox)
The Bengal Administration Report
Transactions, Bombay Medical and Physical Society

LETTERS, COMMUNICATIONS, &c, RECEIVED FROM—

Major H Smith, I M S Jullundar, Capt D W Sutherland, I M S, Lahore Major W D Sutherland, I M S, Akola Capt Rait, Purnea Major W Jennings, I M S Poona, Lt Col W G King, I M S, Madras, Capt McCarrison I M S, Gligit, Major F P Maynard I M S, Darjeeling Major J R Roberts, I M S, Indore, Dr Newall, Calcutta, Lieut Christophers, I M S Madras Major Fearnside, Vellore Capt Standage, I M S, Madras, Capt Lee Abbott, I M S Jhansi, Major B Chatterton, I M S, Monghyr

Original Articles.

MALARIA PREVENTION IN MADRAS *

By W G KING,

I T COL, I M S,

Sanitary Commissioner, Madras

THE attention of all District Medical and Sanitary Officers is invited to G O, No 917 L, dated 2nd August 1904. It will be seen that Government has, in a very complete manner, placed it within their power to effectively press upon local authorities the undertaking of practical sanitary works directed against causative agents of malarial fevers. For the first time in the sanitary history of this Presidency, a District Sanitary Officer may hope to personally superintend the drawing up of schemes in all their details, instead of being obliged to make suggestions which pass into the hands of lay subordinates, and are apt to result in plans that lightly omit details that are of the utmost technical importance. Having regard to the provision of a competent Overseer as a direct subordinate to the District Medical and Sanitary Officer to undertake the making of estimates and the final carrying out of work, and the explicit requirement by Government that both Local Fund and Municipal authorities should do their best to advance such schemes, there is left no justification for neglect of application of the advance of sanitary science in reference to malaria prevention, for which the world is so much indebted to a late Member of the Madras Establishment of the Indian Medical Service, namely, Major Ronald Ross, C.B.

2 It will be seen that Government, whilst giving its approval to measures directed against mosquitoes by killing larvae by means of kerosine and other substances, particularly impresses upon local bodies the importance of undertaking minor sanitary works of a nature that would prove of permanent benefit in respect to the removal of the breeding places of mosquitoes.

3 It has been too much forgotten of late that, although we look to mosquitoes as the great bearers of the malaria germs, and consequently energy has been much concentrated upon their eradication by direct measures, the possibility of getting rid of malarial fever from any locality was by no means a matter of doubt to the sanitarian of former years. It was formerly held that damp soil favoured the propagation of the plasmodium malarie, and that thence it was transferred to the system by winds, the ascensional force of vapours and the like. To water also was assigned the rôle of a malaria germ bearer. The theory that the soil may contain the germ or that water might be the bearer is now received with ridicule. But, having regard to the genus of the protozoon associated with malarial fevers, it would not startle scientific opinion of the present day if it yet be found to possess a second or resting form suitable for soil, and consequently that earth or water may be proved to be not so completely beyond the cycle of operations as has of late years been thought. However, whether this amount of reserve be regarded as permissible or not, there can of course be no manner of doubt of the fact that mosquitoes of the anopheles genus do, as first definitely ascertained by Ross, convey the malarial germ from man to man. But the fact remains that the measures which were directed against damp soil in former days proved efficacious, if of sufficiently complete a nature, without the knowledge that

the mosquito bore the malarial germ. Whilst, as a result of measures against mosquitoes in all parts of the world the utmost that can be reported is that "encouraging results" have occurred, history shows that huge tracts of country that were formerly of a malarial character have been rendered absolutely healthy in the past, by sanitary engineering measures directed towards removal of superfluous moisture of the soil. Algiers is a case in point where, under extensive drainage and cultivation, an unhealthy and malarious climate has been rendered habitable. Perhaps no more striking instance can be quoted than of England itself, where the free use of surface and subsoil drainage in connection with cultivation has rendered malarial fevers practically extinct. Italy, by judicious legislation demanding that wet cultivation shall be at specific distances from inhabited areas has for many years effectually mitigated their incidence. Tommasi Crudeli has also shown that it was by means of elaborate and extensive subterranean works designed to relieve the subsoil of water that the ancient Romans were enabled to maintain fashionable villas in sites surrounding Rome which are now uninhabitable, owing to their malarious nature following the partial destruction and disrepair of these ancient sanitary works. But, if this be true of past measures, it follows that, with the knowledge gained by Ross' discovery, the sanitarian is enabled to work in the present day on more direct lines. In short, the means must remain practically the same as in past years—reinforced by its now being possible to add measures directly against the mosquito itself. At the same time it is probable that only in very rare instances will it be found feasible to rely entirely upon the simple methods that are expected of "mosquito brigades." Such measures may, in limited areas, and especially in the hands of intelligent holders of land and houses distant from habitations of large populations, secure the end, but, as a rule, they will be found of more utility when classed as supplemental to minor sanitary engineering.

4 With these preliminary remarks, therefore, I would proceed to discuss what are known as anti malaria measures. Spoken of concisely, they consist in the removal of superfluous water and moisture to an extent sufficient to prevent no breeding ground for mosquitoes. In taking steps to secure this comprehensive end, the first point that requires attention is the substantiation of the suspicion that a locality is really malarious. Only recently it must be remembered it has been shown by Major Charles Donovan, I.M.S. (Madras), that a disease which was hitherto regarded as clearly due to "malarial cachexia," or a chronic state of ill health attended with enlargement of the spleen and tendency to bowel complication as the result of the action of the malarial protozoon, is not so produced but by the new organism known as the Leishman Donovan bodies. Doubtless, similar great discoveries await other investigators in this Presidency, who will take the trouble systematically to undertake the necessary microscopical examinations. Thus, it is exceedingly unlikely that if following Cartier's work "relapsing fever" is regarded as a fairly common disease in Bombay, the imaginary geographical line dividing the Madras and Bombay Presidencies should inhibit the spirilla of Obermeier. On the West Coast of Madras especially, the possibility of typhoid being mistaken for malarial fever should be guarded against. Again, Major Donovan's discovery has certainly very largely discounted the hitherto recognized value of the "spleen test," as proving the existence of malarial conditions. In no instance, therefore, should any area, however long it may have been notorious for malarial fevers, be considered as fulfilling this description, unless the disease be verified by microscopical examination. Having fulfilled this much, it is desirable a correct conclusion should be come to as to the extent of prevalence, so that data may be obtained as to necessity for anti-malarial action in the first place, and for future employment in

* Being a Circular to all District Medical Officers in Madras, here reproduced on account of its thoroughly practical advice.—Ed, I.M.G.

gaining the improvement of health of the populations concerned. For this purpose, the "endemic index" should be ascertained. This should be procured by the examination of not less than 25 blood films obtained from children below ten years of age resident in the portion of the area supposed to be chiefly infected. It may often occur that medical officers may be so pressed for time as not to be in a position to examine the blood microscopically for diagnostic purposes, and still more rarely will they have time to undertake the extensive examination requisite in establishing an endemic index. Under these circumstances, they should avail themselves of the services of the Superintendent, King Institute, who will report to them as rapidly as possible the results of his examination of blood forwarded by them. In regard to methods, the book "Practical Study of Malaria and other blood parasites" by Stephens and Christophers,* or No. II of Selected Papers of the King Institute, may be consulted. In this manner, by systematic examination of the physical condition of the people, and the endemic index of different parts of the area at large, combined with the consultation of death and birth registers, a very fair opinion will be arrived at as to the intensity of the prevalence of malarial fevers and the necessity for taking action, and whether that action need be of a radical nature or but palliative. The next step would certainly be the attempt to ascertain the extent of prevalence of anopheles mosquitoes, and the identification of the particular species serving the function of malaria bearer to human beings in the special area concerned. In the light of the fact that the anopheles Rossii, which is so largely distributed in Southern India, has been shown by Christophers and Stephens not to be favourable for malaria bearing, it would be necessary not to stop with the mere finding of larvae of the anopheles genus in any particular spot, but proceed to identify their species, so as to ascertain whether they have been formerly identified as good malaria bearers. Where a new species is discovered, and the officer concerned may not care to undertake the troublesome and repeated search necessary to establish its infectivity, the best course is to send specimens to the Superintendent, King Institute. On the subject of the identification of the various forms of mosquitoes, attention is invited to the excellent book the "Anopheles Mosquitoes of India" by James and Liston, which has been recently published.

5 It is usually an easy matter to capture an adult mosquito on walls, etc., in houses by placing over it the mouth of a test tube and, after getting it well within the tube, to quickly plug it with cotton. This detail is referred to as it is a simple method which can be taught villagers, who, for small rewards, can usually be persuaded to hunt for them in cow sheds and deserted temples, in their own houses and so forth, with just as much dexterity as the medical officer himself, whilst intrusions upon private households are prevented and an active interest in mosquito hunting is initiated. By allowing vacant spaces between several plugs of cotton, four and five mosquitoes can be captured in each test tube. Of course, this method of hunting by villagers results in the promiscuous collection of both anopheles and culices, but, as they are readily distinguishable, this is not without advantage, as the importance of culices cannot be ignored in reference to filariasis—disregarding other possibilities of the future. Another way of establishing the species of anopheles is by collecting them as larvae from pools and breeding them up to the adult stage in tumblers covered with cotton gauze. Necessarily, this hunting for larvae and identification of the neighbourhoods in which they are found is of great importance, and it is a work that must be carried out with care and a certain amount of patience. The District Medical Officer may have to inspect the

locality at a period when larvae and mosquitoes are both scarce, and is apt to draw conclusions to the disadvantage of the mosquito theory of transference. If, however, it be recognized that at certain periods in the year, scarcity of these insects may be expected, it but requires diligence to discover their whereabouts. In the matter of anopheles larvae hunting the most disappointing results are at times secured. A very large area may be explored in all likely localities, only in the end to find that larvae swarm in some particular puddle not larger than a soup tureen. Irrespective of the season, it must be remembered that the anopheles are peculiarly fanciful as to selection of their breeding places, and it seems as if only when they cannot secure the actual type of pool they fancy, they condescend to anything less exactly coinciding with their requirements. The type of pool they affect is of the shallow basin variety into which there gently flows and makes its exit a constant stream of clean freshwater. The ooze of springs on the surface, or percolation of water from a high level pool to a lower are therefore peculiarly suitable. The next approach to such a type are protected nooks in streams, where a velocity of less than one foot per second is maintained. Although the anopheles may be found in water that is not without reproach as to filth, this predilection for really clean water is sufficiently strong to present a strong contrast with the culices, which do not hesitate to drop their eggs in the sullage water of dwellings. Having settled the various sites where anopheles larvae are to be found, the next question that presents itself is as to how far it is feasible to eradicate such pools, and, if not, how far it would be advisable to adopt palliative measures by the use of larvicides. To this end, it is necessary to study the whole configuration of the country for several miles round, firstly with the object of ascertaining how far the configuration affects the surface or subsoil water supply and, secondly, in determining from what furthest point the flight of the adult mosquito might be anticipated. The latter point may be at once defined. The information at disposal is most variable, and no authority seems yet to have satisfactorily determined from what distance a mosquito will leave a pool after hatching, proceed to secure blood victims, and return to deposit its eggs. Cell suggests a three-mile flight as possible. Christophers and James think half a mile probable, and suggest a flight beyond this as probably not frequent. On a light wind, it is maintained by others that a mosquito's flight may be measured by seven or eight miles, while the possibility of transfer occurring by means of vehicles, under the shelter of bundles of straw or in the midst of cowdung cakes, must be recognized. On the whole, a mile would seem a fair working hypothesis, until further information is obtained. As to the configuration of the country affecting surface and subsoil water, necessarily, there can be no limit of the area which must be taken into consideration. A complete general knowledge of the trend of the country, of neighbouring hill ranges and of streams, must be secured by actual observation, and by means of maps. Nor when this much has been done should the observer rest satisfied. In a country where irrigation by artificial impounding of streams and surface waters is constantly effected, attention must be given to the influence of artificial canals having their levels above or below the surface soil, not to speak of the attendant huge areas of country laid down under cultivation with the aid of irrigation and therefore rich in mosquito breeding facilities. It would be impossible, in the limits of a circular of this description, to enter into the many points which should constitute a sanitary survey of the nature requisite, but it may be said briefly that the officer should hold in mind and systematically investigate the following points:

6 What is the height of the subsoil water of the area? Is there great variation in one locality as compared with another? If so, what is the cause of variation or what the nature of the obstruction? Is

* A second edition containing many new facts, and provided with coloured plates has been recently published.

it due to the formation of any tank bund reaching to the first impermeable stratum of the subsoil in the direction of the outflow, or to constant soil saturation under irrigation at the natural point of exit of the subsoil water, to the introduction of a canal athwart the natural exit, or to the recent raising of the water level of a river or canal by means of bunds or permanent addition of volume of water, or, instead of being at the natural point of outflow of subsoil water, have such factors been introduced on the upper part of the trend of the country, and therefore of the probable subsoil water gradient. It will be noticed that any of these factors may imply the existence of pools and sluggish streams of water more or less permanent following obstruction to surface and subsoil drainage, or raising of the subsoil water level, and that certain of these conditions might lead, in a country with a fair slope, to a condition of springs appearing at the surface, in such a manner as to produce that periodical renewal of clean water which is the delight of the anopheles. To illustrate my meaning, I cannot do better than refer to instances of tracts in this Presidency that have been artificially rendered malarious. The town of Kurnool was up to 1864, a favorite station of military officers on account of its healthiness, good climate during the cold weather, the production of fruits, etc. But by that year, a canal had been built, in many parts of its alignment, above the level of the country. Immediately below the soil exist laminated layers of limestone, under pressure from the canal the water was capable of insinuating itself between these layers and appearing on the surface at long distances from its point of origin, irrigation was commenced (1865) throughout the surroundings of the town, under these circumstances. To add to the saturation of the soil and subsoil thus brought about, a water-supply scheme for the town itself was inaugurated with much pomp and many prognostications as to the blessing it would prove to the people. This supply was introduced by means of a pervious rubble channel through the laminated rock mentioned. By the year 1867, the former healthy station of Kurnool was visited by intense malarial fever. Nor did the canal merely wreck the health of Kurnool. Wherever it appeared above the surface of the country so as to obstruct the surface drainage and cause oozeings from the canal, owing to water pressure, conditions favorable for the propagation of malarial fever were brought about. In connection with this outbreak of malarial fever, it is worthy of being held in mind that coincident with the opening of the canal necessarily there was a large collection of labourers for excavation purposes, and that these may have well represented the bearers of the malarial germ, whilst the changes in the drainage of the surrounding area presented conditions favourable for pre-existing anopheles capable of infection. A sudden expansion of wet cultivation around the town of Chittoor occurred after the famine of 1876-79, and was promptly followed by an outbreak of malarial fever. The subsequent limitation of irrigation to parts beyond the inhabited areas was followed by a fall of the fever rate as shown by the following figures —

CHITTOOR

Years	Percentage of fevers to total admissions	Remarks
1871	12.2	Increase of wet cultivation
1872	11.8	
1873	9.8	
1874	8.1	
1875	16.2	
1876	21.2	

Years	Percentage of fevers to total admissions	Remarks
1877	17.0	Increase of wet cultivation
1878	45.0	
1879	50.4	Wet cultivation within the inhabited area prohibited
1880	32.0	
1881	16.0	
1882	14.1	
1883	11.3	
1884	19.1	
1885	28.0	
1886	30.9	
1887	18.4	
1888	15.8	
1889	10.9	
1890	5.0	
1891	9.2	
1892	9.6	
1893	9.0	
1894	8.2	
1895	6.8	
1896	5.4	
1897	10.5	
1898	7.8	
1899	7.8	
1900	8.0	
1901	7.8	
1902	4.1	
1903	5.2	

The suburb of Vriddhachalam known as Pudupet was formerly regarded as a healthy place, where pensioners looked forward to spending the remnant of their lives. In 1878, the erection of a bridge below its site possibly commenced changes in the configuration of the river that were rendered suddenly marked by a flood which occurred in 1880, causing large accumulation of silt on the bank on which this suburb rested. There is elevated ground beyond the village whose subsoil water normally discharged into the river. The changed configuration apparently obstructed the subsoil flow, with the result of numerous springs appearing on the surface. Then followed an outbreak of malarial fever, which has rendered the place uninhabitable. The malarious area in this case is remarkably limited as, although the appearance of the springs at the surface as a result of altered configuration within the village site has produced general dampness of soil, irregular springs and pools, the surrounding area is dry. The village of Dhone in the Kurnool district probably owes its existence to there being perennial springs from which irrigation is conducted. The total amount of irrigation is however very small. The spring is led up to the point of irrigation at a velocity that forbids favourable conditions for anopheles larvae. Yet the spring has been so conducted above ground, in certain parts, as to permit of oozeing and formation of pools in its vicinity. The off-flow of the main stream is represented by a river bed which, probably following some great flood, has had its exit much obstructed. Although the river bed is practically dry all the year round, there are frequent pools fed by gentle oozeings from springs which favour the propagation of anopheles. The village surroundings are dry and the neighboring villages are not remarkable for malaria, but the little patch of country represented by Dhone is intensely malarious, and I may say *en passant* if any one wants unusual species of anopheles or blood films of the malignant tertian parasite, this is an excellent place to get them. The existence of malaria in Ennur, thirteen miles from Madras, is notorious. It was, however, formerly the Madras Brighton where pleasure was sought by Madras residents. Such bungalows as are there now are falling into ruins. It remained healthy up to 1896. This year was the climax of conditions causing disturbance of subsoil water for nearly 40 miles up the East Coast of Madras, following

the erection of the harbour groyne and consequent change of configuration of the coast line. It also represented the climax of changes in the Buckingham canal water level, due to insertion of locks and changes in the bank formation producing alteration in the distribution or extension in certain localities, of surface water due to rainfall. At Ennur itself, there had been erected a railway bridge which contracted the outflow of tidal waters from a backwater. All these matters tended to the production of pools and general rising of the subsoil water level. Synchronously with the ultimate expression of these changes, there occurred importation of a large number of labourers from various parts of Northern India to work on the railway, thus furnishing possible malarial germ bearers.

7 The above illustrations obviously afford room for the application of various methods such as, in the instance of a canal aligned above the general level of the country, cutting a catch water drain or subsoil water drain between it and an inhabited area, or of breaking the bunds of a tank including its puddle foundation, so as to permit the free exit of surface and subsoil water at the terminal end of a drainage line the diverting of springs, so as to take a definite course, instead of permitting them to disperse themselves over large areas in the form of pools the making of surface drains so as to connect pools and drain them to a favorable point for discharge the cutting through banks of rivers that obstruct sub-streams from pursuing their original course, cutting into banks of rivers whose configuration has been changed parallel with their course, so as to secure a subsoil drainage system with the exit at a lower point of the river the altering the outlet of channels and small streams and changing the shape of the bed and banks, so as to secure a velocity exceeding three feet per second without allowing of nooks protected by vegetation so as to permit of calm spots, or effectually lining their banks for this purpose with smooth masonry the introducing of water required for garden crops by means of pipes, instead of using open channels and cisterns, and seeing that the quantity is so regulated as to be absorbed fully and daily by the earth to which it is to be supplied the filling in of excavations or natural hollows in which water is liable to accumulate, or the periodical baling of them out individually, or leading them all to a suitable point for discharge, or where such point cannot be secured, for lifting by simple machinery such as picottah, wind, water or oil engine power, etc.

8 It need hardly be said that an officer intent upon remedying sanitary defects for the removing of conditions favourable for malarial fever propagation, must be on the alert lest new inimical conditions arise in the locality he has bestowed his labour upon. For example excavation of new pits on village sites with the object of using the material for house building and leaving them unfilled or undrained, must be checked, the introduction of a railway with its attendant camp of coolies drawn from various parts of the country, must be watched with care, a site distant from the improved area should be advised for the camp, and every effort made to prevent reckless excavation of pits for railway earth embankments in its neighbourhood the introduction of a new water supply should be supervised, and correct disposal of waste water be insisted upon. In the absence of a suitable drainage system and of municipal energy sufficient to maintain plots of cultivation in the neighbourhood of public service taps, the best course is to use filter trenches (*vide* pages 68 and 69 of the Plague Inspectors' Manual). The cultivation of casuarina plantations when newly introduced into a malarious locality demands control. Usually a sandy site with a high subsoil water level is selected, so as to expose by

excavations, at frequent intervals, pools of water that can be utilized for the young trees. The clean water of these affords facilities for the breeding of anophelæ, whilst the trees give excellent shelter to the adult mosquito. The precaution of requiring that, instead of exposing the subsoil water, "pot-wells" with movable covers, or Koch's pattern of subsoil water well with pumps, be employed should ordinarily meet requirements. In old plantations where special watering of trees is no longer required, the filling in of open pools is an obvious precaution, instead of prematurely cutting down the trees, and thus raising financial difficulties.

9 To the above measures may be added adjuvant methods that are of importance. —The weekly distribution of a film of kerosine oil over pools that cannot be drained or filled so as to effectually kill the larvæ, or baling the pools out so as to kill the larvæ by desiccation the breeding of fish in pools and tanks that will live upon the larvæ of mosquitoes the removal of habitations of persons of insanitary habits who will not take the trouble to kill, by the systematic ingestion of quinine, the malarial germs of which they are the bearers, to a distance of at least a quarter of a mile and, preferably, above half a mile from the neighbourhood of healthy persons, a method particularly advisable in encampments of coolies in the vicinity of persons of a superior class of education employing their labour, as advocated by Stephens and Christophers. Lastly, there is the important and much neglected method of forming dry zones in areas where irrigation is practised with such profit as to render its complete abolition financially prohibitive. This zone method is borrowed from Italy, where its use is enforced by law. In 1881, I secured the adoption of this method by the Municipality of Kurnool. A zone around the town having a radius of one mile from the fortifications (included within which was the inhabited area) was established, within which no wet cultivation was permitted. The influence on diminution of malarial fever was most marked, and although certain of the inhabitants considered themselves so aggrieved by the order that they appealed to the local Civil Court, and ultimately to the High Court of Madras against the municipal action they soon became converted, and there is locally no difference of opinion as to the efficacy of the measure. It cannot be said that within this zone all the conditions were obtained that were necessary. In spite of protestations, even to this day, the municipality allows water for garden purposes that is conveyed in leaky rubble channels and produces puddles. On the other hand, there has been an improvement in respect to the public water supply system, which, as originally constituted, gave rise to leakage and formation of puddles by the introduction of a modern town water supply in pipes. But even here no attempt is made to get rid, on safe principles, of puddles near the drinking water taps. Again the zone has not been faithfully observed from the date of its establishment. According as the municipality of the period was strict or not, and in accordance with the Collector and District Medical Officers' predilections, there have been fluctuations in results although, within the last two years, its observance has been well attended to and an extension of about one hundred yards of zone in one direction has been made so as to adapt it to the municipal limits. Moreover, in the zone system, as indeed with every other system, unless provision is made for removal of surface water, rainfall suffices to fill puddles where no puddles should be, notwithstanding the withdrawal of wet cultivation. Unless such matters are attended to, necessarily, after going to the expense of instituting a dry zone in the midst of an irrigated area, the full financial value can not be expected to be realized. Having regard to this fluctuation of conditions above referred to, and remembering that the state of the country beyond the zone remained unchanged, I think the following statistics show that the method is one well worthy of more frequent adoption in this country.

* My own observation would seem to show that even one foot per second suffices, but this requires confirmation.

KURNOOL MUNICIPALITY

Year	Total death rate	Death rate from fevers per mille of population	Percentage of deaths from fevers to total deaths	REMARKS
1880	27.6	18.0	65.4	People recovering from famine
1881	23.3	15.1	64.5	Dry zone of one mile ordered
1882	24.9	13.1	52.9	
1883	29.9	15.2	50.9	
1884	31.6	14.7	46.6	
1885	35.8	18.5	51.7	
1886	26.7	14.3	53.3	
1887	31.1	15.0	48.4	
1888	37.9	16.0	42.1	
1889	37.1	21.4	57.3	
1890	24.0	15.4	64.3	Rules relaxed
1891	33.4	13.8	41.3	
1892	55.2	31.3	56.7	
1893	30.2	17.5	57.9	
1894	31.3	14.7	47.0	
1895	30.5	13.4	44.0	
1896	30.4	13.4	44.1	Famine Public water supply on modern system completed October 1897
1897	53.1	21.6	40.7	
1898	24.6	12.5	50.8	
1899	26.9	13.0	48.2	
1900	29.3	13.4	45.6	
1901	32.0	16.0	49.9	
1902	30.0	11.2	35.5	Rule carefully enforced
1903	29.4	7.3	24.8	

10 The following statistics derived from Italian sources showing the results of suppression of irrigation kindly supplied to me by Mr A. Galletti, 108, are also noteworthy —

RESULT OF THE SUPPRESSION *

Detailed figures

Cases of malaria

	1898	1901	1902
Village of Torrice	1,074	† 106	49

The irrigation canals and drains were in bad condition, the soil calcareous clay, many pools

Cases of malaria

	1898	1901	1902
Village of Golese	646	34	3
Village of Colorno	176	101	25
Village of Cortile S. Mertino	63	34	4

Village of Mezzani — Many of the inhabitants go to Mantua and Piedmont to work in the paddy-fields and come back infected. This village has two swamps and some low-lying forest land along the bank of the Po. The results are not so good.

Cases of malaria

	1898	1901	1902
Village of Menzani	66	89	42
Village of Sorbolo	2	26	8

Of the eight cases in 1902, six were relapses. They occurred in the vicinity of a stagnant pool.

Cases of malaria

	1898	1901	1902
Total for the district	2,850	390	131

* In some places cultivation stopped in 1900, but as the matter was under appeal, there was some cultivation in 1901. The figures of 1902, as compared with the figures of 1898, show the effect.

† Of the 106 cases, 97 cases relapse.

11 Necessarily, the question of irrigation is likely to be the stumbling block in carrying out to the full anti-malarial measures in this country. For example, whilst I conceive it possible some palliation might be brought about by attention, to the details of irrigation, such as legislation, to the effect that no one should newly irrigate grounds without providing for the correct disposal of waste water therefrom, it would be out of the question to anticipate any permanent decrease of malarial fever in an inhabited area within at least one mile of which irrigation is allowed to proceed, if situated within a tract of country where both the malarial germ bearing human being and the favourable anopheles are present for its transfer. The day may come when India may have large tracts of country in which manufacturing industries are of more importance to the inhabitants of particular areas than the production of a few tons more or less of rice, and the inhabitants of these localities may well be able to afford to pay the cultivators of the land due compensation, whilst Government finance may not miss, in the presence of better and more fixed sources of taxation offered by prosperous industries, the revenue from the land. But, necessarily, in the present state of the development of the country where irrigation and revenue derivable by Government from wet lands is of great importance, the question must be approached with care. There is, however, a point at which both the sanitarian and the economist must agree, that is, when a locality becomes so unhealthy on account of malarial fever that it becomes depopulated—not only by reason of deaths but by the influence on fecundity. Undoubtedly, the larger the town the more sound reason is there for establishing a dry zone, and the less reason exists for regarding the interest of the landowner, up to a certain limit, within its immediate vicinity. This fact is recognized by Italian law stating specific distances for towns according to their population. Hence, in recommending the zone method involving abolition of irrigation, a determination must be arrived at by carefully balancing the question of sanitary benefits against the financial results and, in short, ascertaining whether the "game is worth the candle." I would add* as to distances that might be applicable to villages that four hundred yards would seem to be the least radius from which any real benefit can be expected. It is necessary to allude to the well known fact that the existence of irrigation by no means implies the appearance of malarial fevers. For example, there are enormous areas in the south of India where every part of the ground is under wet cultivation, and, if the fever present is really malarial, there is very little of it. Before Ross's discovery, it was usual to account for this condition of affairs by stating that, in one area, the soil contained the living malarial germ and, in the other, it did not exist. But it would be requisite nowadays to account for it by the absence of the malarial germ in the human being in the neighbourhood, and the absence of the special malarial bearing species of the anopheles. As a fact, very little attention has been paid to this question in the southern districts concerned, and it will be a matter of great interest to ascertain, in the near future, whether or not in the area under cultivation by the Periyar irrigation project, malaria may or may not be produced by the juxtaposition of these essential conditions.

12 In carrying out minor sanitary engineering schemes to meet the above ends, it may often result that estimates will show that the work required cannot be carried out with the funds at disposal, if highly finished materials be employed. For example, if estimates for subsoil drains depend upon prices in Madras, plus transport up-country, it becomes hopeless to expect progress. But ordinary village potters can easily turn these out at a very small price, if they be shown once what is required of them. Very often, instead of the use of subsoil drains, by means of cheap labour easily procurable, rubble from neighbouring fields may be

* Extracts showing the nature of Italian legislation on this subject are appended.

obtained, which thrown pell mell into trenches make very good so called "Irish drains" which perform their purpose perfectly well. Again, in rendering a drain sufficiently smooth to prevent lodgment of water, it is by no means necessary to go to the expense of cement plastered concrete or masonry. Rough revetment with boulders, although possibly diminishing velocity, would at least secure the absence of nooks at the side of a stream where the mosquito may deposit eggs with comfort to herself and safety to the future larvæ. In studying economy in connection with channels of water where the use of a smooth lining and increase of velocity are requisite, it may often be found possible to considerably shorten the length of the stream by altering its course in accordance with the levels. In using kerosine oil, it should be remembered that the cheapest variety obtainable in the country may be safely employed. In filling up hollows near villages instead of carting earth from a distance, ruined houses and ruined walls will be found to afford plenty of material. Where the material thus rendered available is stone or sound brick, it should serve for "Irish drains." Clearing such structure out of a village would be of benefit in respect to perfestation.

13 When offensive measures against the mosquito, by killing the larvæ and by getting rid of favourable places for their vitality, cannot be effected, the next course possible is the protecting of the inhabited houses against inroads of mosquitoes, by the use of wire netting throughout the verandahs and doors* or, at the very least, by causing the inhabitants to retire within a special room of their houses reserved as the "mosquito room" after sunset and not allowing their exit until after sunrise, when mosquitoes would have returned from their nightly prowling after blood. A still cheaper measure, though not so fully efficacious, is the supply of mosquito nets surrounding beds. The use of veils covering the whole head, with covers for the hands, and tying in of the end of the trousers, are routine precautions adopted by night-workers in malarial regions in Italy at the present time. Measures such as these would certainly be of advantage in connection with jails and railway stations or in lighthouses, where small communities are often placed in unhealthy positions. Nor should the immense value of the systematic use of quinine in killing the actual malarial germ in the human bearer be forgotten. These must be conducted in a systematic manner, and the mode laid down in this Office Circular No. 962-S, dated 20th June 1900, which is derived from Italian experience, is recommended.

14 In proceeding to conduct improvements after the "endemic index" of the infected area has been definitely ascertained, it is desirable that the officer should traverse the whole tract of the country with his overseer, and personally point out to him what is required. The overseer should then prepare a survey plan of the area exhibiting its contours and levels. Upon this should ultimately be exhibited the various pools in which anopheles have been actually found. It will then be possible for the officer to consult with the overseer as to the best points for discharge of surface water, or removing sources of obstruction, etc. After the plan and estimate have been fully prepared, the District Sanitary Officer should again visit the area, and come to a final determination as to the relative financial and sanitary value of various methods proposed for effecting the desired object. For such work, the new class of Sanitary Inspectors who have undergone Minor Sanitary Engineering training ought to be of great value. If the locality dealt with contains a police, railway, lighthouse staff or other small community, it would be well to arrange for transfer of the whole as soon as all sanitary work is complete, so that it should be possible to at once

ascertain their preventive value instead of results being confused by attacks from old infection. In villages where the measures above indicated are not possible, it may often be feasible to remove the habitations to an entirely new site. In all cases, the termination of sanitary works should be the signal for the systematic distribution of quinine to households by a specially appointed subordinate, in whose presence each dose should be administered, and the maintenance of a careful record by him of fever attacks within the area concerned. It need not be said that these records should be from time to time checked by microscopical examination of blood films, so as to verify the malarial nature of the attacks.

APPENDIX

Italian Regulation of the 3rd February 1899, relative to Rice Lands, to Marcite Meadows, and to Irrigated Meadows

TITLE I—OF RICE LANDS

1 In future no one shall be permitted to convert land into rice fields, without the special permission of the prefect of the department in which the land is situated.

2 Offenders shall be punished by a fine equal to twice the value of the annual produce of the land formed into rice fields without permission. The proprietor equally with the tenant shall be subjected to the above fine unless the former can prove his ignorance of the act of contravention.

3 Permission to establish new rice fields can be granted by the prefects only under the following limitations, viz—

First—That the field so established shall be at a distance from the capital of the kingdom of at least 8,000 metres (4 97, or say 5 English miles).

Second—That they shall be distant from communes of the first class and fortified places, at least 5,000 metres (4 97, or say 5 English miles).

Third—That they shall be distant from communes of the second class, at least 2,000 metres (1 24, or 1½ English miles).

Fourth—And finally, that they shall be distant from communes of the third class, at least 500 metres (0 31, English mile or about 530 yards).

4 The distance prescribed in the foregoing article shall be measured in right lines from the exterior walls, in the case of walled spaces, and in that of open places, from the last house which forms part of the aggregate habitations of these places.

5 The rice fields now existing within the distance prescribed for the capital shall be adapted for other cultivation, within the space of three years from the publication of the present decree, under the penalty specified in article 2.

6 With reference to the other communes of the first, second and third classes, proprietors of rice lands now existing within the prohibited limits are prepared to continue the cultivation of them until otherwise ordered. They are forbidden, however, to increase and extend their rice cultivation without the permission prescribed in article 1.

7 We reserve the right to determine farther regarding the above prohibitions, and the periods of their execution, after we are in possession of the opinions of the Municipal Councils of the respective communes, and of the councils general of the departments on the points referred to.

The minister of the interior is requested to direct the prefects to submit the present question for the consideration of the municipal and general councils.

The deliberations shall be held during the next session, and the decisions shall be immediately forwarded by the prefects with their own opinions attached.

TITLE II—OF MARCITE AND IRRIGATED MEADOWS

8 It is forbidden to establish constantly or periodically irrigated meadows in the interiors of inhabited places.

* Celli reports that in the case of 183 railway employees thus protected, in a highly malarious region, only five were attacked, and they were proved to have neglected precautions. See also *Lancet*, December 1, 1900, page 1603, and *British Medical Journal*, December 8, 1900, page 1672.

9 By the close of the present year all such meadows shall be adapted to other kinds of cultivation

10 It is equally forbidden to establish such meadows in the vicinity of communes of the first class or fortified places, without the permission of the prefect

11 This permission shall be granted only on the following conditions —

First—With respect to the capital, the irrigated lands shall be distant 1,000 metres at least (0.62 English miles or about 1,000 yards)

Second—With respect to the communes of the first class and fortified places, the lands shall be distant 500 metres at least (about 530 yards)

The distances shall be measured as for rice lands

12 Before the close of the year 1911, all permanently or temporarily irrigated meadows within the distance of 1,000 metres from the capital, and of 500 metres from first-class communes and fortified places shall be employed for other kinds of cultivation

13 The provision in article 2 shall be applicable to offenders against articles 8, 9, 10 and 12

14 The fines received for violations of the present decree shall be levied by the receivers general of finance, and shall be paid into the royal treasury

15 The ministers of the interior and finance are charged with the execution of the present decree in all that concerns their respective departments. It shall be published and recorded in the *Bollettino delle Leggi*

THE MANUSCRIPTS OF NAPLES AND THE VATICAN, AND THAT OF BONCOMPAGNI (ALBERTOTTI) CONCERNING THE OPHTHALMIC WORK OF BENVENUTO, WITH SOME CONSIDERATIONS AND THEORIES OF RECLINATION OF CATARACT*

(Continued from October 1904)

By PROFESSOR GIUSEPPE ALBERTOTTI, OF MODENA

(TRANSLATED BY MISS K E WILKINSON)

Process of Proposed Reclination

CONCEIVING the idea of entering the anterior chamber through a small opening by means of a ligish instrument and passing it behind the iris so as to act upon the anterior surface of the lens, I had made the instrument now to be described

Description of the Instrument

The instrument which may be called a



reclinator with handle, reminds one of Snellen's loup but is shorter and less stout. It measures about 6 x 5 mm and has a gap in the circle at one side of about 2.5 mm. It is bent like a ring flattened laterally and slightly curved on the flat

The instruments are modified for use with right and left eyes. In another type of instrument the loop is bent sideways at a right angle



to the stem, the bent portion lies in the same plane as the flat portion of the handle

Description of the Operation

(a) The patient is seated, the operator is seated to one side in front of him if the left eye is to be operated on, at his shoulder if the right eye, and straight in front if the operator is left-handed

(b) If the operator is at the shoulder of the patient, the head of the latter should rest on the chest of an assistant. The operation may also be carried out with the patient carefully laid on the operation table. In this case the patient's head ought to be raised and held. In the clinic I operated sometimes with the patient in the first position, sometimes in the second, and perhaps as I am accustomed to operate upon the patient in bed I find the second position the most convenient

(c) The eyelids are held apart by the assistant, or by a speculum

(d) The bulb is fixed by grasping it with a fixation forceps, applied to the upper conjunctiva near the upper edge of the cornea, as is done in Angelucci's extraction of cataract

(e) The operation may be carried out in two different ways which constitute two varieties of the same process. I will describe them successively, always supposing that the eye being operated upon be the left and that the operator be in front. The pupil of the eye to be operated upon must be previously dilated

1st Variety—The necessaries are—The paracentesis needle or the needle bent at an angle by Bowman or the knife of F. Guerin modified by Raymond for corneal paracentesis, and a straight reclinator like the 1st type of the above described instruments

1st The cornea is punctured below its middle at about 2 millimetres from the corneal periphery. The puncture of the cornea ought not to be directly through the thickness of the cornea but rather slanting, which can be effected by holding the blade of the instrument with its plane parallel to the plane of the iris

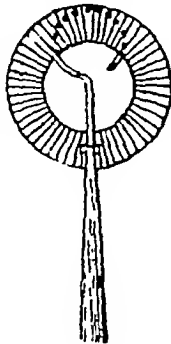
2nd The introduction of the hook into the anterior chamber and its being placed in contact with the anterior face of the lens. This manoeuvre requires a certain ability. The reclinator is held by the operator with the right hand and is introduced into the eye with the handle raised and with the convexity of the plane of the stem turned towards the internal or nasal angle

The free end of the stem is then introduced into the corneal wound so that it enters into the

* We herewith publish the text of Professor Albertotti's article (which has been sent us by Major F. P. Maynard, F.R.C.S.) The opinions of this eminent Italian Surgeon are of interest in view of a recent discussion in our columns—Ed., F.M.C.

anterior chamber from below upwards, and it is pressed up, almost as if one hooked the cornea always holding the stem so that it may appear in profile

The free end of the hook having reached the superior part of the anterior chamber, the instrument is made to describe a semi-circle being rolled at the same time between the fingers. With this movement the loop has penetrated across the corneal wound and the hook may easily be got into the pupillary hole, running behind the iris into the posterior chamber in such a way as to reach the edge of the lens from above and to remain hidden from the lens in the superior part (v Figure). The notch in the stem shows the internal position of the hook.



3rd The gradual raising of the handle of the instrument so as to detach the capsule of the lens from its peripheral adhesion and depress it with the cataract in the vitreous. In this movement of raising the instrument, the fulcrum remains in the part of the instrument which encircles the corneal wound. The pupillary space appearing to be free, the dislocated cataract should be held fixed for about a minute and a half holding the handle of the instrument still and raised.

4th Extraction of the instrument. The handle is lowered, and the hook re-introduced into the anterior chamber, turning it flat in profile. It is not difficult then to extract it from the corneal wound.

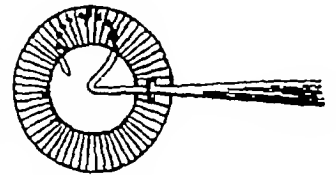
2nd Variety—Necessaries. Tapping needle as in the 1st and a bent retractor (2nd type of the instrument described).

1st Puncture of the cornea about a millimetre below the horizontal diameter and about 2 millimetres in front of the pericorneal ring.

2nd Introduction of the hook into the anterior chamber and its collocation and contact with the anterior face of the lens. The retractor is held with the right hand and is presented to the eye, operating with the handle behind and with the convexity of the hook turned upwards. The hooked extremity of the stem is introduced into the corneal wound and is pushed up horizontally, towards the extreme interior of the corneal diameter, as far as the length of the hooked fang permits, then the handle of the instrument is lowered vertically after which it is made to describe a half circle from below to above, guiding the movements of the hook so that it rests in contact with the anterior surface of the lens, so—though not letting go—the handle of the instrument is reconducted making it perform a quarter of a circle in the same plane so as to bring the concavity of the stem in line with the anterior convexity of the lens in its superior part.

The second movement is completed when the interior portion of the hook is placed in the pupillary hole, the superior extremity of which meets the upper edge of the lens (v Figure).

3rd One impresses a rotatory movement with the instrument on its own axis of about 90° towards the operator. By the effect of this, seconded by the fixation of the bulb, the hook presses on the cataract, severing it, and initiates the depression of it.



4th The hook is re-introduced into the anterior chamber, rolling the handle inversely and the hook is finally extracted from the anterior chamber.

Small Spiral Hook—If the capsule of the cataract be accidentally lacerated during the operation one finds, not infrequently after some time, the pupillary field full of remains of adhering capsule or of membrane. I have constructed another instrument (v Figure) for this.



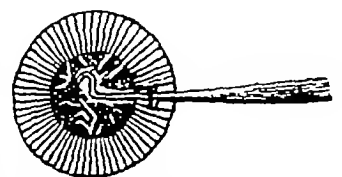
On the same handle are mounted two spiral hooks, one with the spiral turned one way and the other with the spiral turned the other. Others are mounted separately. The point of the hook is not sharp but round, nearly like the point of the usual hook for iridectomy. The use of the hook is as follows—

1st Perforation of the cornea in such a place possibly in correspondence with the pupillary margin, with the tapping needle or with Scarpa's needle.

2nd Penetration of the hook into the anterior chamber across the corneal wound, presenting it normally to the cornea and turning it between the fingers on its own axis.

3rd As soon as the hook shall have penetrated into the anterior chamber, lower the handle of the instrument (if the corneal wound is done below) and inclining it to the outer part (if the corneal wound be done to the outer part) so as not to place it in the iris.

4th Hook with the point of the spiral hook the bits of membrane sticking to the pupillary field (v Figure) and then turn them round the hook, turning the instrument gently on its own axis.



In this movement, the membrane, not roughly dragged, gets loosened from the adherence which it has with the iris.

5th The pupillary field being thus freed, the instrument is drawn out, turning the hook in a contrary way.

During the extraction of the instrument, the hook frees itself from the bits which were turned round it and they drop in to the anterior chamber, whence they can remain harmless or be easily absorbed; or they lie in the corneal wound, and, in this case, if the wound be large enough they can be caught by a pair of forceps and removed.

CASUAL COMMENTS.

By J. R. ROBERTS, F.R.C.S.,

MAJOR, I.M.S.,

Residency Surgeon, Indore

THE multifarious duties thrust on the Civil Surgeon do not give one much time to work up an elaborate and carefully prepared article for this Gazette. It is, however, my endeavour to jot down a few comments on my experience in much the same way as one talks when meets a brother doctor. "There are fifty ways of doing things, and every way is right," as Kipling says, so that the only excuse one has for putting forward and recommending certain methods, in medical and surgical practice, is that they have proved valuable to oneself, and may be of use to the beginner and the student. These are after all only a series of "tips," which one is always endeavouring to gather from one's brethren, or to give in exchange. Under these circumstances do not expect any order or method in these notes, their value lies in that one is at liberty to dance about from one subject to another, and to touch each lightly. Let me therefore begin on Diseases of the Skin —

It is extraordinary how disappointing antiseptics prove when applied for skin disease. I make it therefore a point to consider their antiseptic properties as secondary to the reaction of the preparation they are served up in thus—is ung so and so, acid neutral or alkaline, and as the majority are neutral, it is as well to render them either acid or alkaline before condemning the preparation as useless. Thus take that inveterate disease, seborrhœa of the scalp, which is associated with similar patches on the front of the chest over the sternum, and behind between the scapulæ. You may go the round of the pharmacopial ointments and lotions, find every one does good, but none effect a cure. Acidify your ointment, say ung hydrag ox. flav with tartaric or citric acid, and the result will be very different. Not, however, that I recommend ointments for this disease, but rather use a powder rubbed into the scalp at night and brushed out in the morning, a mixture of the zinc oxide, boric acid, citric acid and salol will do. In this disease the microbes are in the sebaceous follicles, deep down in the skin and remedies do not penetrate. That may be so, but in spite of the lesser penetration of the powder, it cures

and the ointment does not. Besides the powder is a cleaner preparation, and I take it that the acid is the real curative agent. This seborrhœa is a very widespread and a very infectious disease in India, and very destructive of hair-bulbs and follicles. My impression is that it is more common among persons associated with horses such as cavalry soldiers. The small red patches in the scalp, the itchiness, the accumulation of epithelial scales and the formation of greasy crusts over the hair roots are well known to you all. To cure, you must wash the linings of caps and helmets, hair brushes and combs, otherwise reinfection takes place. Gallons of hair wash will not cure the scalp, therefore try the powder I recommend.

By the way boric acid powder is very valuable as an adjunct to the hygiene of the skin in diseases such as rheumatic and enteric fevers when the odour of the patient is marked, a little applied occasionally to the axillæ, perineum and between the buttocks does away with any unpleasantness. To mucous surfaces it must not be applied too thickly or too often or it will irritate. There is no reason why the soiled linen of persons in health should have a stale odour if the powder be occasionally dusted into socks, into the axillæ, etc.

Another disease that comes frequently to one's notice is acute pustular eczema, or staphylococcus infection of the skin. It spreads like wild-fire, and the more antiseptics you apply in the shape of lotions the more it spreads. There is nothing, however, better than lead lotion, on lint continually kept moist with the application. I remember among many a case in a sepoy. It spread rapidly over his whole body with its course rendered more swift by mercury and boric lotions, until the man got secondary fever resembling that of smallpox. The infection spread from a sinus in the groin, and cure was only obtained by keeping the patient for hours every day in a warm bath, the water of which was changed several times a day. An antiseptic added to the bath only brought out fresh eczema to turn purulent in its turn.

Staphylococcus infection from a boil as an original focus occasionally produces acute multiple deep seated abscesses, the early opening of which is most essential in order to prevent bone or other mischief. A case I had was in a young man, who complained of sudden fever and pain in both thighs and in one shoulder, rheumatism one might have called it, but on searching I found a boil on his neck. I made incisions over the seats of pain, evacuated one small collection of pus from the periosteum of one femur, another from among the extensor muscles of the opposite thigh, but the one under the scapula I could not find at the time though I eventually did when its size became larger. The method of search was merely that of plunging a director in various directions from a small skin and deep fascia incision. Another

example of this class of case, which is common enough, was in an officer with boils, who refused to have them opened. Later on I had to search for deep abscesses in his case, one in the gluteal muscles and one on the femur. He had had a year previously a large abscess in the muscles of the back, following a boil.

Concerning boils I believe the best treatment to be early incision and the injection, with a hypodermic needle, of a few drops of pure carbolic acid into the core, whether the slough has formed or not. It has the advantage of preventing subsequent crops of boils. I am told Professor Wright has a serum for inveterate boils. We meet many examples so persistent in their reappearance, that we have to recommend a change of climate. My impression is that, as boils come with the hot weather, rancid butter and putrid meat have more to do with their appearance than mangoes.

Another puzzling cause is that of *Urticaria impetiginoides*, common enough in the hot weather, the sufferers from which blame the rapacity of the local mosquito, as the rash appears on the extremities. Advise, however, your patients to cease eating butter. When one enquires into the manufacture of butter on a large scale, some curious putrefactions must certainly occur. Thus, the cream is separated and is allowed to stand for some 12 hours in order to turn, before it is churned, otherwise the public will complain of tasteless butter, now twelve hours is too long in the hot weather, and a nice crop of *Urticaria impetiginoides* results, with much scratching. Domestic butter in the best of regulated families is not free from blame.

You may take it that the majority of your cases of ordinary *Urticaria* are due to some product of milk, such as cream, ices, dahi or ghu, in which bacteria have been at work. The worst case of *Urticaria* I ever saw arose from eating an ice, lasted for a fortnight, then attacked the mouth, gullet, stomach, and duodenum, ending in an acute attack of catarrhal jaundice.

Cream ices should be abolished from the Indian menu. They are all very well in your own well supervised establishment, but you are leading a bad example to less well regulated households, who unwittingly poison their guests. *Urticaria* is the least of many evils due to cream ices.

DISLOCATIONS AND FRACTURES

I have had to deal with upward dislocations of the acromial end of the clavicle. The reduction of this form is a simple matter, but to keep it in its place when reduced is quite another. The joint is a most essential one for the free movements of the shoulder, to wane is therefore out of the question as it would mean ankylosis. The outer end of the bone is displaced, but slightly outwards, being held by the coraco-acromial ligaments to the scapula. My experience is that when such a case occurs in one's practice the best

treatment is to leave it alone, and to assure the patient that within a month he will have as good a shoulder as the other, neither losing in strength or in movement.

Fracture of the clavicle—The many methods devised for the treatment of this injury alone make one suspect that none is efficacious. One has seen quite good results obtained by treatment in the village, *z e*, practically no treatment at all. It is, therefore, quite reasonable that the less you worry the patient the better. The pad in the axilla is uncomfortable, bandages get loose and require readjustment, and as the case progresses the deformity is quite alarming, in spite of every care you may have taken. However, you can safely ask the patient to reserve his judgment for another year, when the improvement will be better than you ever expected. You will find Saye's method quite good enough, but you must remember if you wish him to be comfortable dust his axilla with boric powder and put on a light fitting gauze vest before you adjust the strapping. Saye's method errs on the side of fixing the hand, it is not necessary to do this, let it go free, and let the patient use it for writing, if it be his right hand, as a safeguard, however, put a figure of eight bandage round both shoulders to keep them from drooping forward, with the axillary portions lightly padded. Thus to employ a figure of eight bandage round the shoulders, sling the forearm and elbow in a triangular bandage, and fix the arm to the side by a broad strip of strapping round the chest, is as much as is required, and as successful as any other treatment without putting the patient to discomfort.

Injuries and dislocations to the elbow-joint are always a source of interest and difficulty. The surgeon cannot be too careful in taking measurements from the olecranon to the condyles in order to compare with those of the opposite arm. I once had occasion to wire an ununited fracture of the olecranon in a clergyman, and did it by the usual horse-shaped incision, base downwards. During the operation I was struck by the excellent view one had of the joint, and this has led me on three subsequent occasions to operate on fractures of the lower end of the humerus by wiring, in order to try and obtain a better result than simple setting of the fracture, or that of excision of the elbow-joint. I will describe the operation minutely, as there is no such one mentioned in the text-books, it is applicable to recent and old fractures of the lower end of the humerus with displacement, and to old dislocations of the elbow-joint, one or both bones. A large horse-shoe shaped incision with the base upwards is made over the back and lower end of the humerus with its point curving over the olecranon, about one inch from the upper end of the latter. The horse shoe is placed more on the outer than inner side of the joint, in order to give a free exposure of the outer condyle of the humerus,

and the head of the radius, and to avoid the ulnar nerve and vessels on the inner side. The olecranon is cleared and sawn across, and is then reflected with a flap of muscle, including a portion of the supinator brevis and anconeus, and the whole thickness of the triceps. This latter can be peeled off as high as necessary from the humerus, and the whole joint then lies open, exposing the lower end of the humerus, which let us suppose is fractured. This can be drilled, and the wires inserted without any difficult manipulation. A dislocated ulna can be replaced, and the operation is completed by wiring the sawn olecranon process, old clots, etc., can be cleared out of the joint as one proceeds, and the head of the radius examined. In the three cases I have done, two gave good results, the first required subsequent excision owing to the extreme formation of callus locking the joint. Should I have occasion to excise an elbow-joint for old injury, I shall do it by this same horse-shaped incision and leave the triceps attached to the sawn olecranon. I shall remove the ulna portion of bone required in the operation from the sawn lower surface of the ulna below the olecranon and wire this latter to the shaft of the ulna, and by this means secure the attachment of the triceps. The usual method leaves a weak elbow-joint as far as extension movements are concerned.

Not enough stress is, I think, laid on the use of internal, angular splints in fractures of the humerus and forearm. Fix the joint above and below a fracture is a good axiom, and in the arm it can only be done by an internal angular splint. District dispensaries should be well supplied with these splints. Cases turn up from time to time giving evidence of their want. Thus a man comes with ununited fracture of the humerus, he has been treated by a straight external and internal splint reaching only to the elbow, or again a useless forearm presents itself, because it has been bound between two straight splints extending from elbow to wrist. The forearm therefore rests in a position of pronation, the four fractured ends fall together and are joined by one mass of callus, the whole thing requires a considerable operation to repair the mischief, whereas an internal angular splint and an external straight splint keeping the forearm midway between pronation and supination, and the fractured ulna and radius well separated, will prevent such a disaster.

Collis's Fracture—The rule in the treatment of this fracture should be "reduce the displacement." That is usually easy enough by drawing on the hand, but the moment the tension is relaxed, the displacement recurs. To treat the fracture by two straight splints is therefore obviously a mistake, as the displacement remains uncorrected. The pistol splint is an abomination, for though it succeeds in this point, yet it will be months before the patient recovers the use of his wrist and fingers. These

have been stiffened by their long imprisonment. Gordon's splints are good, but they are elaborate, and you are unlikely to find them in this country, where expense is the first consideration. The point about Gordon's splints is that they attempt to keep the wrist bent now that is exactly the key to the treatment of this fracture. Reduce the displacement by drawing on the hand, then bend the wrist to an obtuse angle, and lo and behold, the displacement does not reappear, the tendons at the back of the wrist act most opportunely as straps. Remember therefore to maintain this position of the wrist when putting up the fracture. The apparatus is simple in the extreme, a straight padded splint reaching from the elbow to just beyond the phalangeal extremities of the metacarpal bones. Place this on the anterior or flexor aspect of the limbs, so that the fingers grasp the end of the splint. Insert a good big pad under the lower end of the radius, strap the hand down to the splint, and another piece of strapping round the splint and arm above the fracture, put a bandage over all, and the thing is complete. It is not a bad thing to put the hand in a white cotton glove dusted with boric powder. The glove keeps the hand warm and protects the skin from the strapping. In this apparatus the fingers can be moved, can never get stiff, and passive movement of the wrist is begun after a fortnight.

Fracture of the Nasal bones—To have to treat a broken nose is a decided responsibility if you are unsuccessful, you have made one enemy the more, who walks about as a standing advertisement of your bad surgery, and whose nose is forever appearing when it is least wanted. A woman with a crooked nose will never forgive you. Fortunately you can avoid the disaster by being firm to begin with, insisting on chloroform there and then, and with what instruments you can get together proceeding to set the bones and septum. You may not have septum forceps in your possession, but you can improvise with others, and you will find to your joy that when you have set things straight, they remain in good position, doing away with the necessity of any elaborate apparatus. A piece of drainage tube over which a piece of lint has been sewn and dusted with boric powder is useful if introduced into one or both nostrils when the septum has been injured. The specialist has elaborated an operation for straightening of the septum, whether due to injury or occurring as a congenital deformity. The specialist must elaborate, it is his *raison d'être*. You need not, however, fear the operation. A gum lancet will make the cross incisions through the septum, forceps will straighten the cartilage after these have been made, a piece of drainage tube as above will keep every thing straight, and cocaine anæsthesia will meet the requirements of the case.

(To be continued)

SOME ANALOGIES WHICH FAVOUR PROTOZOAL HYPOTHESES OF BERI-BERI

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It has long since been remarked that beri-beri in its etiology shows resemblances to malaria and yellow fever. Of recent years a number of diseases, notable features of which are that they are strictly limited to places having a warm temperature and that they show groups of obviously related cases though the patient *per se* is not sufficient to convey infection, have been shown to be due to protozoa. Malaria, kala-azar, probably yellow fever and possibly sleeping sickness are to be reckoned amongst them. In fact so many diseases which display the above characters have been shown to be caused by protozoa that the occurrence together of these features may be said to establish a considerable probability that a disease if infective is caused by an organism which has a more complicated life history than a bacterium. The great majority of diseases due to known bacteria are obviously at times directly contagious, of the exceptions cerebro-spinal fever and tetanus are about the only ones which can be said to show place infection and grouping of cases in any way comparable with what is seen in beri-beri. Thus the limitation of this disease to places having a warm temperature and the harmlessness of the patient apart from his surroundings would, if the disease is due to infective organisms, tend to place it by analogy amongst protozoal rather than bacterial diseases.

Again it seems at first thought unlikely that any human disease, in the spreading of which direct contagion appears to be an important factor, would be confined to places having a warm temperature. For how can the germ be disadvantageously affected during direct transference? Nevertheless such diseases do exist, and if we enumerate them—*tinea imbricata*, *pruita*, *pemphigus contagiosus*, yaws, *verruca peruviana*, dengue, yellow fever and possibly a few others such as ulcerating granuloma—we find that they are, with the exception of yellow fever and dengue, either simple skin lesions in which the germ must be exposed to the climate or diseases in which the output of material is through extensive lesions of the skin. Of the exceptions yellow fever has been shown to possess a false appearance of direct infection. The fact that dengue now stands alone establishes a probability that it also presents a false appearance of direct infection. Work has been done which tends to show this (Graham, *New York Medical Record*, February 8th, 1902). Although bacteriology does not enable us to define a group it would be equally unlikely that a bacterial disease other than a skin lesion, in which passive persistence apart from growth of the germ outside the body

was a factor in spreading the disease, could be rigidly confined to places having a warm temperature for the effect of cold is rather to preserve than to destroy bacterial organisms. If beri-beri were directly infectious or if infection could be due to passive persistence, as opposed to growth, of infective bacteria deposited in the surroundings of the future host, then it is very unlikely that it would be rigidly confined to places having a warm temperature. It is therefore reasonable to suppose that beri-beri is confined to such places either because a germ, infective or otherwise, is obliged to grow outside the body and requires a warm temperature in which to do so, or because it is caused by an organism which needs a special agent to transmit it or which must undergo further development along a life cycle before it again enters man. The multiplication of infective bacterial germs outside the body in natural conditions is difficult to prove. Though it is almost certainly necessary for the continued propagation of some diseases, in extremely few that are due to known bacteria can it be such an important factor and so dependent on heat that the disease is obliged to remain permanently in places having a temperature as high as that required by beri-beri. Malta fever and mycetoma may approach to being exceptions. Cholera and bacterial dysenteries though sometimes called tropical show extensions far into temperate zones. The theory that beri-beri is due to growth outside the body of an organism, the toxin of which is absorbed, has few or no analogies except amongst diseases traceable to the ingestion of special foods. Moreover, it would explain very well a large number of observations on tropical protozoal diseases especially the group bearing on the harmlessness of the patient apart from his surroundings, we made the word malaria and found a protozoan. The theory does, however, stand alone in the readiness with which it explains the early improvement of the patient when removed from infected place.

The supposition that beri-beri is confined to places having a warm temperature because the organism may be transmitted by a special insect or because it must go through further stages of development in a life cycle more complex than that possessed by bacteria before it can again infect man finds many analogies among tropical protozoal diseases.

Beri-beri shows many close analogies to malaria. It resembles this disease in being favoured by heat and damp, in being a place infection and attacking those who sleep near the ground. The outbreak of beri-beri in the individual is like malaria apparently as dependent on physiological depression and other factors as on an incubation period with definable limits. Beri-beri like malaria if nursed in hospital in cold climates never spreads to other patients or to nurses. Hospitals within the endemic area may become infected but rarely do so, though scores

of patients may be aggregated. In places where there is a hot and cold season, such as Japan, beri-beri, like malaria, crops up at the beginning of the warm season, continues and gradually increases throughout the summer and dies out almost entirely as far as fresh cases are concerned in the winter. In the tropics it occurs all the year round but is generally more prevalent in the rainy season. As in case of malaria the mortality is generally greatest in low latitudes. Beri-beri resembles malaria in its chronicity, in its tendency to relapse and recur it may be annually in the subject, in perhaps the ultimate acclimatisation which is said to occur, and in the lesser susceptibility of those residing permanently in endemic areas. Beri-beri resembles malaria in being a house disease. It is also an institutional and gang disease (H. E. Durham and others). Sambon has pointed out an instance in which it was markedly a gang disease but failed to be a house disease (*B. M. J.*, Sept. 1902). Now the distribution of infected anophiles has shown malaria to be to a considerable degree a house disease. It is also a gang disease, for it has, I think, been conclusively shown that the virulent malaria which breaks out on extensive disturbance of the soil is due to the collecting together of men, and the crowding of susceptible persons, good crescent cases and anophiles mosquitoes under the same roof. Malaria attacks the sexes nearly equally and is a disease of all ages but especially of childhood, beri-beri, though a house disease, is far less often seen in women, children and the aged than in working men who spend less time indoors. The explanation of the curious age and sex incidence of beri-beri is probably to be found in the fact that it is a gang disease.

When we think of the way diseases counterfeited each other and digress from type we shall scarcely look upon similarities in signs and symptoms as an indication of a similar cause, but it is natural to ask whether the features of beri-beri show any marked resemblance to those of diseases due to protozoa. The oedema of beri-beri is firmer than that of nephritis and may occur in transient patches, it is not unfrequently general. The occurrence of firm general oedema and firm patchy oedema is somewhat rare in disease, but is a marked characteristic of the protozoal disease trypanosomiasis. In this connection may be mentioned the facies of both diseases. In protozoal affections we might look for a large mononuclear leucocytosis and marked enlargement of the spleen, but these are not found in yellow fever.

Beri-beri, in regard to its etiology, has been shown to present many close analogies to malaria. If this is due to its cause being highly specialised on similar lines, then the points which do not compare will indicate ways in which the causes differ. It would appear that all the factors necessary for the contraction of beri-beri may be found existing within the limits

of a hot and dirty dwelling in a climate otherwise unfavourable. This is not so in malaria, moreover malaria is a rural disease, beri-beri, more a disease of towns. These differences could be explained by assuming a different intermediate host or the absence of one in beri-beri.

In trying to form details of a protozoal hypothesis of beri-beri which shall roughly resemble that of malaria we have to consider the much emphasised point that in bad epidemics the patient will probably show improvement in two or three days if he can be removed, but not if he is left in the infected place. A conceivable explanation of this might be found in a frequent introduction of the germ and a rapid subsidence of its chief toxin producing phase. We should not expect this phase to go on actively for many days as in malaria without re-introduction or a period of latency. A latent form would, as in malaria, account for elements in relapse and chronicity. And a comparatively non-toxic long lived form, perhaps the same as the latent form, perhaps a gamete as in malaria, would account for the obscure origin and long latency of outbreaks and the fact that beri-beri is a disease of assembled men. Consider a person in a highly malarious region who is beginning to show serious symptoms the result of chronic malaria. If he is left he will probably get worse, removal will probably lead to his recovery. If we could raise the endemic index and shorten the acute disease resulting from a single infection, the result would approximate to that observed when a person suffering from beri-beri is left or removed from the place where he has contracted the disease.

In looking for a hypothetical intermediate host we shall expect that it is to be found, (1) in towns, (2) in occupied dwellings, (3) in inhabited parts of ships that have proceeded long since from warm to cold climates, and (4) we should expect that it is not sufficiently self motile, at any rate when infected, to move from one house to another or readily even from room to room.

Conditions 1 and 3 would exclude many mosquitoes, they would not, I think, exclude *Stegomyia fasciata*, 4 probably would exclude it. None of the above restrictions would exclude fleas, bedbugs or pediculi. The thermal limitations of beri-beri might be thought to weigh against the probability of pediculi, or to necessitate ovum or larva infection in the case of fleas. An intermediate host has been assumed for the sake of closer analogy, there is no absolute necessity for it, though the difficulty of disinfection would tend to indicate one. In its absence we might suppose that a protozoan germ after leaving the body is obliged to develop further in warm moist places before it can again enter man through skin, sores, or other surfaces. Theories of disease must present a reasonable explanation of the facts which have been observed with certainty. They also as a rule follow naturally

upon what is known of other diseases, indeed, their rationality is intimately bound up with this, for instance, Hamilton Wright's theory follows naturally upon diphtheria and other diseases. It may, I think, be claimed that in the above respects protozoal theories of beri-beri have, by recent discoveries in tropical pathology, been raised to a level of probability scarcely inferior to the theories of Manson and Hamilton Wright, that they serve to keep in mind the necessity of examining the fresh tissues and the fluid in the cedematous patches by the most recent methods, and that they urge the useful search for and study of protozoal parasites in insects found in association with man. In some trypanosoma infections the organisms are found with extreme difficulty except in the cedematous patches. Although the parasite of beri-beri may be ultramicroscopic or otherwise undemonstrable in man, we know that in malaria and we believe in yellow fever that the organism is far larger in the alternate life cycle.

A Mirror of Hospital Practice.

ORBITAL SARCOMA—KRONLEIN'S OPERATION

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LACHIA, Chamar, aged 45 years, was admitted into the Ophthalmic Hospital, Agra, on February 28th, 1905, giving the following history—

About six months ago, one day, while chopping bundles of hay, a heavy chip struck his left eye. Since then the sight in that eye has gradually failed, and he has noticed steadily increasing protrusion of the globe, but at no time since the injury has there been any manifestation of inflammatory symptoms or pain of an acute nature. He has merely complained of a sense of heaviness and tension. It is possible, therefore, that the accident was merely a coincidence, and has no causal significance.

The following note describes the condition at the time of admission. There is a swelling under the left upper lid pushing the eyeball bodily downwards, outwards and forwards, causing considerable proptosis. The eyeball has thus come to rest almost on the malar prominence. On raising the eyelid a distinct tumour can be seen wedged in between the eyeball and the roof of the orbit, it appears to be larger than a walnut, rounded in shape, and elastic to the touch. It is slightly moveable, and distended vessels can be seen crossing its surface. There is considerable lacrimation, the

cornea is clear, the anterior chamber shallow, and the pupils moderately dilated and fixed, other media clear. On ophthalmoscopic examination, a uniform greyish haze appears all over the fundus, the disc can be made out with difficulty, its surface being blurred and hazy, and the outline indistinct. The patient is stone blind and has absolutely no perception of light in that eye. General health fair.

Operation.—Assistant-Surgeon C M De, in charge of the Ophthalmic Hospital, having brought to my notice Dr F P Maynard's account of a successful operation performed by Kronlein's method (*Ophthalmic Review*, June 1904), I decided to perform a similar operation in this case. Accordingly on the 3rd of March, the patient being anaesthetised, and the left temple and eyebrow having been shaved and rendered aseptic in the usual manner, a curved incision, with the convexity towards the outer canthus, was made down to the bone, extending from the temporal ridge to the zygoma. The flap being turned backwards, the periosteum on the outer wall of the orbit together with the lachrymal gland was then raised and pushed towards the eyeball, and kept away with a retractor during the rest of the operation. The periosteum over the external angular process of the frontal bone was next raised, and then gently separated with an elevator from the bone over the whole of the external wall of the orbit. The external angular process was then grooved with a Heys' saw about half an inch above the fronto-malar suture, and finally cut through with a chisel. The chiselling was next continued obliquely backwards and downwards through the great wing of the sphenoid to the spheno-maxillary suture. Lastly, the frontal process of the malar bone was sawn through horizontally, and the piece of bone thus marked out was turned outwards. The chisel not being a very fine one, the small piece of bone above the fronto-malar suture here became separated and was removed.

The orbital periosteum was then slit up from before backwards, and the tumour being now exposed, was shelled out with the finger. This was accomplished without any difficulty and it was not necessary to cut any of the ocular muscles. The bone was then replaced and the skin brought into position with horse-hair sutures, a horse-hair drain being left in the outer angle of the wound. The eyeball now completely receded into the orbit, and the lids were closed over it.

Two points need to be particularly noted about the operation—

1 By not slitting the external canthus, as was done by Dr F P Maynard in his case, the conjunctival sac was preserved intact, and there was therefore no risk of bacterial infection of the wound.

2 No division of the ocular muscles was made, and therefore there was no danger of deviation of the ocular axis after repair.

Examination of the tumour (Macroscopic)—Length $2\frac{1}{2}$ ", width $1\frac{1}{2}$ ", weight 11 diams, encapsuled, lobulated, firm consistency, white and homogeneous on section, no hæmorrhages or cysts. Microscopically the growth proved to be large spindle-celled sarcoma.

Subsequent history of the case—There was an uninterrupted progress towards recovery. The wound healed by first intention, and when the eye was opened on the 7th day, the patient was found to have excellent vision, and perfect movement of the globe in all directions. There was, however, some ptosis, doubtless due to stretching of the levator palpebræ, and a moderate cedema of the upper lid. Both these symptoms are now slowly passing away. At the time of writing, *viz*, March 31st, ophthalmoscopic examination of the fundus shows it to be quite normal in appearance, and his vision is $\frac{6}{6}$.

Remarks—According to Dr Maynard this operation has only been performed 48 times—our case is therefore the 49th. The only recorded case in the United Kingdom appears to

tion strongly to the notice of ophthalmic surgeons in India, and I am sure they will find it preferable in every way to the old operation of enucleation of the globe, and removal of the tumour by incision of the fornix. The operation is easy to perform, and the only essentials are a sharp and thin chisel and a light touch.

I am greatly indebted to Assistant-Surgeon C. M. De for bringing the operation to my notice, and for his assistance both at the time of the operation and during the subsequent treatment.

A MODIFIED METHOD OF TRANSPLANTING A PTERYGIUM

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THE usual method of transplanting a pterygium is to sew the detached growth into an incision in the conjunctiva below the cornea.

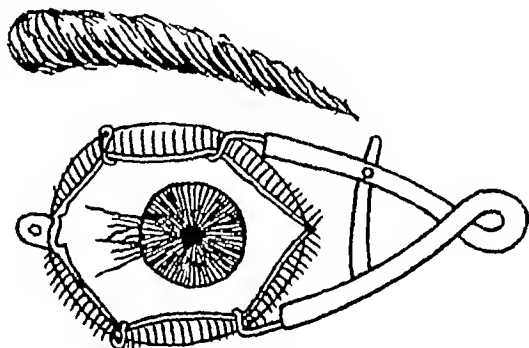


Fig I

Left eye with pterygium on the inner side

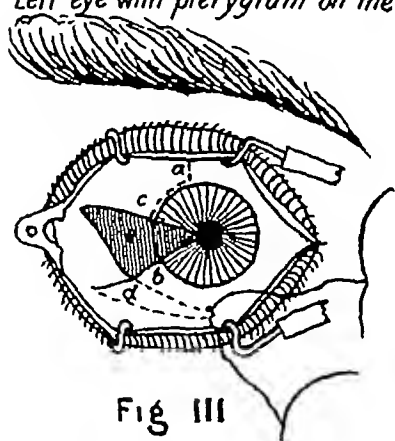


Fig III

Pterygium transplanted

e Raw surface left

c a Line of incision for plastic operation to cover e

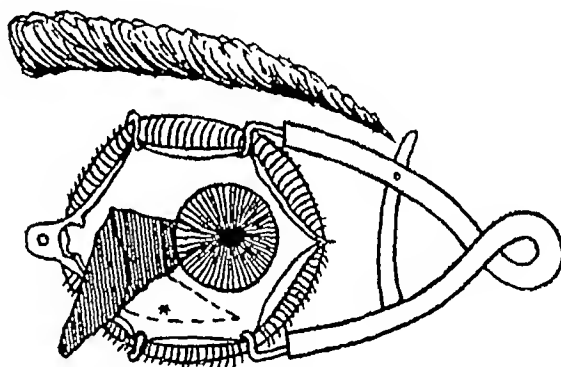


Fig II

* Tunnel for transplanting pterygium

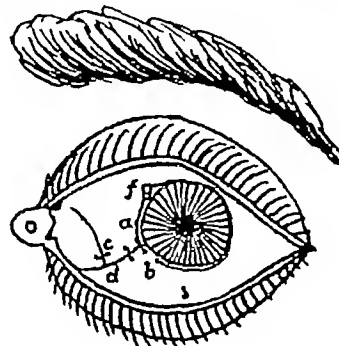


Fig IV

Points a & b & c & d brought together by sutures

f Raw Surface left

be one successfully performed by Dr Louis Werner for a tumour of the optic nerve (Swanzy's Diseases of the Eye, 8th Edition). I therefore feel justified in bringing this opera-

This method has the disadvantage that the head of the growth often becomes detached from the bed into which it has been sewn. The method of turning the head of the growth

back on to its own base seems to me wanting in finish, as it is inclined to produce a lump *in situ*, and as it leaves an open wound

I have therefore during the past year modified the usual procedure. After dissecting up the growth to its base in the usual way, I tunnel under the conjunctiva immediately below the cornea with a pair of scissors thus forming a blind pouch with its base at the line of lower section of the pterygium and its apex in the line of the middle of the cornea below (Fig II). A silk suture is next fitted with two needles, and one of these is passed through the head of the growth. Both needles are now carried into the pouch above described and brought out at its apex a short distance apart, one being 2 mm vertically above the other. On drawing the two free ends of the suture tight and tying them the head of the growth is dragged into the cul-de-sac where it is surrounded on all sides by raw tissue and where it never fails to unite with the surrounding part (Fig III). In order to close the raw surface left at the side from which the growth was dissected, a flap is raised as shown in Fig III, and is slid down so that the points *a* and *b*, and *c* and *d* are respectively brought into contact (Fig IV). Two sutures fix them there, the speculum being removed before these are tied. The result is that no raw surface is left. I have employed this operation 39 times in the last twelve months, and have never known the pterygium slip loose from its new bed. Though a raw surface is shown at *f* in Fig IV, such a surface is often inappreciable or non-existent. The exact adaptation of the secondary covering flap depends on the size, &c, of the pterygium, and must be modified for each operation. I sew the lower corner of the flap to the edge of the transplanted pterygium, or to the free edge of the original lower cut in the conjunctiva made by dissecting out the growth.

TWO CASES OF DEATH FROM HÆMORRHAGE INTO THE PERITONEAL CAVITY IN CONNECTION WITH THE SPLEEN

BY R. HENRY MADDOX, M.B.,

MAJOR, I.M.S.,

Civil Surgeon, Ranchi.

THESE notes refer to two consecutive cases of bodies brought in for *post-mortem* examination during January 1905 and are, I think, of more than usual interest.

Case I—Examined on 24th January 1905. Karona Pahan Munda, aged about 45 years. The body was that of a well-nourished middle-aged man.

Decomposition was advanced. The cuticle was raised into large blebs and peeling in many places. The mouth was full of maggots, which were also found in many other parts of the body.

No wound, or bruise, or other mark of external injury could be discovered in any part of the body.

The brain which was very much decomposed showed no sign of injury, nor, so far as could be seen, of disease. There were some signs of old pleuritic adhesions between lobes of both lungs, and both lungs showed signs of chronic congestion.

The heart was dilated and enlarged, and its walls were pale and fatty. The valves were healthy, and there was no evident sign of disease of the larger vessels.

The abdominal walls were much decomposed, but appeared healthy and no sign of injury could be detected, nor could any sign of extravasation be found, on dissection, in any part.

On opening the abdomen, an enormous amount of fluid and clotted blood was found in the abdominal cavity and filling up the pelvis.

The peritoneum was much infiltrated with blood in the region of the splenic vessels, and some old adhesions were found between the fungus of the stomach and the spleen.

The stomach with its contents, after removal, weighed 1 lb 10½ oz. The peritoneal coat in the cardiac region was infiltrated with blood.

The principal amount of blood clot was in the region of the splenic vessels around the pancreas, transverse portion of duodenum and splenic flexures of colon.

The splenic vessels were evidently ruptured at a short distance from the spleen, but the parts were so much softened and friable that they broke up at once on handling, and it was not possible to exactly localise the site of rupture.

The spleen weighed 2 lbs 11 oz and measured 10¾ inch × 5¾ inch × 2½ inch. It was very greatly enlarged, soft, friable and congested, but no sign of any rupture could be detected at any point. There were two very large notches at the anterior border.

The small intestine had its peritoneal coat infiltrated with blood in the upper part, but appeared otherwise healthy and uninjured.

The large intestine, as above noted, had, in part, its peritoneal coat infiltrated with blood, but was otherwise healthy and uninjured.

The liver weighed 3 lbs 6½ oz, was greatly enlarged and showed marked fatty degeneration.

The kidneys were pale and fatty. The capsule and surrounding parts of the left kidney were infiltrated with blood.

An opinion was expressed that the laceration of the splenic vessels appeared to have been caused by some jarring as by a fall or some slight external injury which left no mark.

No definite history of any injury was given by the Police, but on account of the suddenness of the death the body had been sent on for examination.

Case II—Examined on 28th January 1905. Duga Pahan Munda, aged about 55 years. The body was that of a well-nourished elderly man. Decomposition was not marked, and a small amount of *post-mortem* rigidity was still present in the lower extremities.

There were no wounds, bruises or other mark of external injury to be seen and, on incision of the abdominal and thoracic walls, no signs of injury or extravasation could be detected.

The scalp, skull and vertebræ were healthy.

The dura mater showed extensive adhesions to the skull about the middle line especially posteriorly. The meningeal vessels were much congested.

There was a great excess of a turbid fluid in the subarachnoid space throughout the brain and throughout the ventricles.

The larger vessels of the brain were markedly congested, but the brain substances generally was anæmic. No evident sign of disease of the brain could be discovered.

The chest walls were healthy and uninjured.

The right lung weighed 1lb 2oz, was much congested and the air spaces dilated.

The left lung weighed 7½ oz was markedly fibrous throughout and contained practically no air at all. The whole organ was fibrous, contracted and puckered.

The heart weighed 14½ oz and was much enlarged. The walls were fatty and contained blood and clots within the cavities. Nothing special was noted regarding the valves.

The aorta was atheromatous and the ascending portion much dilated. In the thoracic aorta was a large quantity of dark *post-mortem* clot, also a large *ante-mortem* clot measuring about 4 inches.

The abdominal walls appeared healthy and uninjured. There was much increase of adipose tissue.

On opening the abdomen the peritoneal cavity was found filled with blood and some large clots, the largest of which measured 3" x 2".

The peritoneum though much infiltrated with fat especially in the great omentum showed no marked sign of disease.

The stomach appeared healthy, and contained about 2oz of a pinkish turbid fluid with an acrid smell.

The intestines were healthy.

The liver weighed 2lb 0½oz, and showed a marked fibroid change with fatty degeneration of the lobular.

The spleen weighed 3 oz and measured 3¼" x 2½" x 1". There was a rupture running up the lower end of the anterior border 1" long containing blood clot. The outer convex surface of the spleen had its capsule raised into a bleb in the centre 1½" in diameter within which was some blood clot.

The kidneys showed increase of fibrous tissue and fatty degeneration of the parenchyma.

Both knees showed an excess of fluid in the joints with thickening of the synovial membrane.

The deceased was said to have died as the result of a blow from his son. The son, who was present at the time of my making the examination, informed me that his father had for a long time been lame from a rheumatic

affection of his knees and could only get about with the help of a stick and had frequent falls. The condition of the knees corroborated the son's statement, and it is probable that the rupture of the spleen was the result of a fall.

Remarks—These two cases show certain points of similarity and also others of marked dissimilarity.

Both were members of the Munda tribe, an aboriginal tribe of Chota Nagpur, in which men tend very rapidly to age after 40 years of age and further, as age advances and the capacity for work diminishes, less ordinary food is taken, and life is to a very great extent sustained by quantities of rice beer or 'haria'.

Both died as the result of a copious hæmorrhage into the abdominal cavity, and in neither could any external mark of injury be detected either externally, nor after a dissection of the parietes in the region of the sources of the hæmorrhage.

This absence of external mark of injury is undoubtedly uncommon. In Lyon's Medical Jurisprudence for India, 3rd Edition, edited by Lieutenant-Colonel Waddell, it is stated (p 143) that in rupture of the spleen there is no mark of injury externally in one third of the cases recorded, and out of this one-third some sign of extravasation had been detected on dissection in one fifth.

In Case I, no rupture of the spleen could be found, the hæmorrhage having proceeded from the region of the splenic artery between the spleen and the aorta. I examined the spleen carefully for a rupture, but could find none, and even had there been a small rupture, or even several minute ruptures, they would hardly cause such an enormous effusion of blood filling the abdomen and pelvis and causing death so rapidly as the appearances of the body seem to show.

This must be a very rare condition, and had I not seen the case, I should find it difficult to believe that there had not been some error in observation. I can find no parallel case in Chevers' book or the other literature at my disposal, and can only consider, that the weight of the very large spleen caused the rupture by dragging on the vessels, the stomach being at the time loaded with food. The parts were much decomposed and tore up on all sides on my attempting a more detailed dissection of the splenic vessels.

A point which seems to confirm the fact that the source of the hæmorrhage was in the first place extra peritoneal, is the infiltration of blood between the peritoneal coat of the stomach and the intestines and the visceral walls proper and also the infiltration about the left kidney. It would thus appear that a portion of blood found its way outside the peritoneum while the greater part burst through the peritoneum, probably at the time of rupture, and poured into the peritoneal cavity where the resistance would be comparatively low.

The other points which may be noted are —

In Case I the spleen was enlarged and congested belonging to the class of McLeod's "Hypertrophied engorged spleen" (see Medical Jurisprudence for India by Norman Chevers, M.D., 1870, page 462), whereas in Case II it was not much more than half the normal size and would be classed in McLeod's "small hard spleens"

In Case I, though the organ was so much enlarged, no rupture of the spleen was found, but in Case II the spleen being about half the normal size, there were two ruptures, one of which was on the anterior border which may perhaps be included as a rupture of the inner surface (the commonest form of rupture), and a rupture of the outer convex surface which occurs less than half as frequently as rupture of the inner surface. Lieutenant-Colonel D. G. Crawford (*Indian Medical Gazette*, June 1902) found only a single rupture in three-fourths of his cases.

In Case I, the stomach was loaded with food, in Case II, it was almost empty and yet, in case II only was the spleen ruptured and it was below the normal size.

In neither case was any other viscus directly affected by the injury.

No history was obtained as to the period of survival, but from the appearances of the blood it would appear that death was considerably more rapid in Case I than in Case II.

A further point of interest is the difference in the condition of the other organs notably of the liver, lungs, heart and great vessels in the two cases. There is no doubt that in Case II the hardness of the spleen was a contributory factor, but it would be difficult to say how far the condition of the other organs affected the issue. Unfortunately only a conjecture can be made as to how the lesions were produced in either case as so far as I can discover in neither case was any assault seen by any witness.

GLUTEAL ABSCESS WITH ANEURISM OF THE SCIATIC ARTERY

By H. R. DUTTON,

Lieut. I.M.S.,

Medl. Offr., 8th Rajput, in charge Cantonment Hospital, Barrackpore

A KUVIRAJ, aged thirty, was admitted to the Cantonment Hospital suffering from pain and swelling in the right buttock. He was carried to the hospital as he could neither walk nor stand, and his right leg was kept straight, as he was unable to flex his thigh. He had suffered with this for two months and had seen various native doctors and others without any relief having been obtained. He said he had never had a fall, strain, or other injury on the site of the present pain. He was very emaciated and debilitated, but there were no signs of tubercle present and no history of any.

On primary examination the right buttock was found to be considerably enlarged and

lounded, and the skin over it distended and shiny, but with no special spot of redness or bulging discernible. The swelling was greatest between the great trochanter and ischial tuberosity and extended to within one inch of the iliac crest. A sense of heat was present, and he complained of great pain on pressure. Fluctuation was with difficulty obtained. The thigh was kept extended and absolutely rigid. Temperature at night 100°. The next day he was prepared for operation and placed on the table, and under the anæsthetic the limb could be rotated and extended but only slightly flexed. With an exploring needle pus having been found, I made a vertical incision two inches long through the skin and superficial and deep fasciæ and opened up the pus cavity by Hilton's method. About one pint of slightly sanious pus was evacuated. I then explored the extensive cavity towards the hip-joint and neck of femur, but found them normal. Suddenly a very severe arterial hæmorrhage occurred, so I packed the whole cavity tightly with gauze, the patient's condition at that time not warranting any further operation. He recovered well from the anæsthetic. The next day about 32 hours after the operation he complained of great pain, so I removed the packing and irrigated the cavity and repacked it. The wound continued to discharge a great deal of sanious pus daily. On the eighth day severe hæmorrhage occurred, so I packed the cavity again tightly, but the next day hæmorrhage having recurred, I decided to cut down and tie the gluteal artery if I could not find the bleeding point. This latter I could not do, so I tied the gluteal artery at the upper part of the sciatic notch. In spite of this the hæmorrhage continued, and exploring carefully with the finger, in the lowest part of the first incision, I found a sacculated aneurism of the sciatic artery about the size of a pigeon's egg. I passed two pairs of Spencer Wells' forceps over the sac and the hæmorrhage ceased. The patient's pulse was weak, so I rapidly closed the second incision and packed the whole cavity lightly. The forceps were removed at the end of 36 hours and the cavity gently irrigated and a gauze drain inserted. Two days later all discharge ceased, the second incision healed by first intention, and the cavity filled up, and the patient was discharged completely cured eighteen days after the second operation, with full use of his leg again.

SHORT NOTES ON SURGICAL CASES TREATED AT ARAMBAGH DISPENSARY

By ASST. SURGEON PREMANANDA DASS,

Arambagh, Hughli

THE following notes show the varied cases which may come for treatment to a remote sub-divisional dispensary. Arambagh, in the Hughli district, is eighteen miles from the rail. Though the head-quarters of a subdivision, it has only

a small dispensary with six beds. The daily average number of patients for 1904 was, in-dooi, 132, out-dooi, 45 68

1 *A case of Imperforate Anus*—A new-born child was brought by his father to Aiambagh hospital on 11th May 1904, from Chandui, a village about three miles from Aiambagh. The abdomen was extremely tense and tympanitic. The child had passed no wind or stool since birth, and had not passed water since 2 P.M., on 10th May 1904. The face was livid. Apparently on account of difficulty in respiration, abdominal muscles hardly moving. The superficial abdominal veins were prominent, on account of extreme tension of the abdominal wall. The margins of the anus were found to be adherent on examination. An incision had been made on one side by a local medical practitioner who gave up the attempt.

The margins of the anus were stretched by fingers, an incision was made in the middle line, and the whole of the little finger introduced. A membrane could be felt about $1\frac{1}{2}$ " from the surface, which was ruptured by the finger, and at once there was a gush of meconium. The child passed a quantity of meconium after this. Bladder was relieved by soft catheter. No. 1. There was no abnormality in the urinary passage. The bowel was not stitched to the margin of the anus. The child recovered.

2 *A case of Rhinolith Nasal Calculus*—Sukhoda Devi, Hindu female, aged 42, attended hospital, on 23rd May 1904, from Mallaypur, a village about six miles from Arambagh. She stated that for a long time she had been feeling some foreign body in her nose, was not aware of the entrance of any foreign body. For the past one year she had been feeling very uncomfortable, passed thick mucus from her left nostril, developed all the symptoms of nasal obstruction, dyspnoea, asthmatic attacks during eating, had to breathe through mouth. According to the history which she gave all her troubles in the nose were spontaneous in their origin. The index finger of the left hand was passed into the left nostril, and a hard substance was felt embedded tightly in it, entirely blocking it. It was at first taken for a foreign body. Forceps was tried, a portion of it came out which displayed evidence of formation of layers. The nasal cavity was then dilated with speculum, the stone was put in a convenient position, and was then pulled out with forceps. The whole stone was embedded in a mass of inspissated mucus which came out with it. There was copious hæmorrhage, which was controlled by tannic swabs. The whole stone when dry, weighed one diam and fifty grains, was of irregular shape, and exhibited traces of layer formation.

Remarks—The extreme rarity is my apology for keeping a record of the case. Bryant says that he had seen but one instance, "which even occurred in the practice of Mr B. Duke of

Clapham, and which proved to be due to the introduction of a foreign body." The absence of the history of any foreign body and the presence of thick inspissated mucus in which the stone was embedded, suggests that it originated round a nucleus of thick mucus. All writers agree that these stones invariably originate round a foreign body or a plug of inspissated mucus.

3 *A case of Compound Comminuted Fracture—Amputation Recovery* Jatindia, Hindu male, aged ten, resident of Bhabadighi, a village about five miles from Aiambagh, was admitted on 28th May 1904, with the following injuries reported to have been received from a fall from a tree.

- (a) Compound comminuted fracture of the right humerus and radius extending into the elbow joint, with extensive laceration of muscles.
- (b) Comminuted fracture of right radius and ulna at lower third. Both the bones appeared to be smashed to pieces.

Considering the nature of the injuries, the idea of saving the limb could not be justified. With the full permission of all the relations, amputation was decided upon. The patient was put under chloroform, amputation was undertaken at the lower part of the upper third of right humerus, and was finished in twenty minutes including chloroforming. The boy made an excellent recovery, and was discharged from hospital on 15th January, eighteen days after the operation.

Remarks—

(2) The higher temperature recorded after the operation was 100°F , and that only for the first three days. The temperature was practically normal throughout.

(1) The wound practically healed up in ten days, after which only simple boric ointment was applied. Practically no pus was formed. As the patient had lost much blood before admission and was weak, he was kept in the hospital for a few days to recoup his strength.

A case of Liver Abscess—Operation Recovery Babu, Hindu male, aged twenty-five, resident of Shahpur, five miles from Arambagh, was admitted on 12th May 1904 for the treatment of liver abscess.

Previous history—Had been suffering from intermittent fever for years. Had been getting fever lately every evening (hectic ?), gave history of an attack of dysentery five months ago, which lasted for ten days, pain in the hepatic region for past one month, and noticed swelling in the hepatic region below costal arch eight days ago. Denied history of alcoholism.

Present symptoms—Localized swelling below costal arch, just outside right nipple line. Fluctuation was present. Pain and tenderness on percussion were also marked. Liver and spleen in contact with one another. Girth of chest at level of nipple = 27". Abdominal girth at level of umbilicus 22". Heart and lungs healthy. Admission temperature 99.2°F .

Operation—The hepatic region was antiseptically washed. An incision about $1\frac{1}{2}$ " long was made across the fluctuating swelling, $1\frac{1}{2}$ " below costal arch, just outside the nipple line. The incision was deepened. Until the liver substance could be felt by the finger, when a gush of brick-coloured pus, pathognomonic in appearance came out of the abscess cavity. The finger introduced could feel the adhesions all around. A rubber tube of medium bore was inserted. The wound was antiseptically dressed, a pad of carbolic tow being finally put upon the dressings, and then bandaged.

Progress and result—The patient was put upon a mixture of chloride of ammonium and taraxacum. The wound was dressed with warm iodine carbolic lotion (strength = 31 of Th. Iod. to $\frac{1}{2}$ pint of carbolic lotion 1 in 40), and dressed every morning.

Temperature never rose above normal after the operation. Bowels regular throughout. The discharge from the wound consisted of lumps of necrosed liver tissue and clots of blood, which gradually decreased in quantity. It was interesting to observe the daily increase of interval, and the decrease of dulness between liver and spleen, which were in apposition with one another on admission. This of course was due to evacuation of pus, and shrinking of abscess cavity and consequently of liver.

The patient made an excellent recovery, and was discharged from the hospital on 6th June—the 24th day after the operation, decidedly in a much better state of health.

A case of Strangulated Hernia—Relief by cold water douching Puina Chander De, Hindu male, aged forty, resident of Chotadongal, a village about six miles from Arambagh, was admitted for the treatment of strangulated hernia on 30th August 1904. On admission all the symptoms of strangulation were present. The hernia was tender and painful, the skin over it reddened. Percussion elicited dulness and resonance over different areas, nausea, retching, hiccough were all present, constipation was absolute, no wind being passed, pulse very small and frequent, face pinched and anxious.

Treatment—Immediately on admission, a dose of stimulant mixture was given, and the instruments were kept ready. In the meantime, however, the parts were shaved, washed antiseptically, and a trial was given to cold application and elevated position. The patient was made comfortable in bed. Hot bottles were applied to the extremities. The foot of the bed was elevated as far as possible. As ice could not be procured in such an out-of-the-way place, a cold lotion of chloride of ammonium, nitrate of potash, and rectified spirit, was improvised. The cold water was made to fall upon the hernia from a douche apparatus placed high above the bed. A favourable result could hardly be anticipated from this in a hernia of fully four days strangulation, but after the lapse of half an

hour, it was found that the swelling had considerably diminished, and after a few minutes smart douching with very gentle manipulation of the hernia (as he had enough of taxis outside), the whole of the gut was reduced. A pad was put on and kept *in situ* by bandages. As the patient was anxious to go home, he was allowed to go in a *palla*, with all the necessary instructions given to him, I heard about two weeks later that he was in his usual health.

Remarks—There is nothing remarkable about a strangulated hernia being reduced under ice, but this is the first instance in my experience of a case of hernia, of so much as four days strangulation, being reduced under cold water douching. About the authenticity of the period of strangulation, I have no doubt, as I also learnt subsequently from a highly qualified medical practitioner who tried taxis, that he had seen it on the third day of strangulation on the day before the patient attended hospital.

The idea of improvising cold water douching may be useful in such cases in out-of-the-way places.

A curious case of Hiccough—Traction on the Tongue—Immediate arrest Nambala Dasi, Hindu female, aged fifteen, of Omapuri, a village two miles from Arambagh, attended hospital as an out-door patient on 21st November 1904. She used to get spasmodic attacks of hiccough of a mild character almost daily for the past four months. These attacks lasted for a few minutes and then passed off. For the past one week she had been getting these attacks 20 to 25 times daily. She got four attacks in the hospital in the course of an hour. Each attack lasted for about ten minutes, and consisted of an uninterrupted series of spasms accompanied with a crowing noise. The attack was followed by first a condition of asthma, which lasted for a few minutes, then exhaustion, and finally sleep. Intellect remained clear during the attack. Pulse-rate was accelerated and counted 140.

Treatment and Remarks—Chloroform inhalation was first tried, but was given up as it appeared to produce no effect. A mixture of bromide belladonna, valerian and chloroform was then administered. As the attacks in the hospital were so frequent that the girl was becoming exhausted, their immediate stoppage appeared absolutely necessary, accordingly vigorous traction was applied to the tongue for a minute, and the spasms were arrested at once. This was tried in two successive attacks, after which the patient did not get any attack in the hospital. She was allowed to go home with instructions to apply traction, and to take the mixture. She returned next morning and reported that she had only four attacks. She did not get any further attack in the hospital.

The interest of this case lies in the violence of the attacks, and the simplicity and efficacy of the plan of stopping it. The condition was probably hysterical.

THE
Indian Medical Gazette.
 JUNE, 1905

RATS AND PLAGUE

"Go," cried the Mayor, "and get long poles,
 "Poke out the nests and block up the holes!
 "Consult with carpenters and builders,
 "And leave in our town not even a trace
 "Of the rats!"

The Pied Piper of Hamelin

THOUGH the connection between rats and plague is as old as the history of the disease, it is by no means yet settled in what way plague-infected rats can infect healthy man, or infected man infect healthy rats, but the connection between rats and the disease is pretty certain, and is supported by an abundance of evidence. But though the two phenomena, human plague and rat plague, are obviously connected, it is by no means implied that there is a close quantitative relation between human and rat mortality, that is, rat mortality and human mortality from plague do not always run *pari passu*.

It is probable moreover that still further evidence will be forthcoming of the part played by fleas in conveying the disease from the infected vermin to man.

Nevertheless rats seem undoubtedly to be one link in the chain of causation, and we therefore look with interest and hope upon the endeavours which are now being made in many infected towns to war against rats.

It is of importance therefore to know something about rats and their habits, just as modern methods of malaria prevention depend upon an accurate knowledge of the habits of certain species of mosquitoes.

In recent issues this year, in order to call attention to the importance of the matter, we have published valuable and interesting articles by Capt W. Glen Liston, F.M.S., now a member of the new Plague Research Commission. Rats, it is well known, belong to the order Rodentia, sub-family Murinæ. There are numerous species in the genus *Mus*, but practically speaking we are concerned with two only, viz, the *mus rattus*, or, *Alexandrinus*, and the *mus decumanus*.

Let us take *mus rattus* (or *Alexandrinus*) first. It is, according to Capt Liston, "the

common domestic rat of India." It has many varieties with different names, and it has habits which bring it into contact with man, and this fact is of the utmost importance in relation to the spread of plague. This rat lives in houses, in holes in the floor, and in the roof of huts, and is consequently brought into the closest relationship with man.

It is described as follows — 'Dark rufous grey above, white below, size large, over 6 inches, tail much longer than the head and body *

The varieties of this rat seem to grade insensibly into one another, as Liston says

"The rats of Kashmir and the neighbouring region agree perfectly with the Egyptian specimens of *M. Alexandrinus*, then proceeding southward we find their fur becoming rather coarser and more rufous, the animals becoming smaller, though presenting still much the same proportions. On the other hand as we go from Kashmir to Nepal we find every intermediate state between the true *M. Alexandrinus* and the fine haired comparatively short-tailed variety *nitidus*. We must therefore consider them all to be of one species, especially as we often find specimens, which, without a knowledge of locality, it would be impossible to assign with certainty to any one of the different forms," i.e., *Alexandrinus*, *nitidus*, and *rufescens*.

This rat, *mus rattus*, was formerly the common rat of England, but of recent years it has almost entirely been displaced in Europe generally, by the larger and more formidable brown rat, *m. decumanus*, so much so that the well known naturalist F. T. Buckland, writing in 1852, says that even then the "old English" or black rat could only be found in the Isle of Dogs.

Even in India the *m. rattus* is giving way before the aggressive *m. decumanus*, which though originally it seems to have come from the East, is now finding its way back to India, being introduced by the shipping into various seaport towns.

This rat, *m. decumanus*, or the brown rat, is also called the "Norway" rat, though it did not come to England from Norway.

All over the world, wherever the brown rat is found it has exterminated, or will exterminate, the black variety. It can always be distinguished by its shorter tail and ears, from its first cousin, the *m. rattus*.

Captain Liston, in the interesting article already referred to, shows that the introduction of the brown rat into Europe and the fact that

* In one variety *nitidus*, the tail is only a little (1 inch) longer than the body (Liston)

people at that time began to live in better houses coincided with the disappearance of plague in Europe, not that *m. decumanus* is insusceptible to plague, but because he does not live in clean, European houses, but haunts drains, cellars, and sewers, where he comes less in contact with man, and hence even when plague infected will spread the infection less than his more domestic cousin, *mus rattus*.

The fecundity of the rat is great, as F T Buckland says, "the rat is a most strict observer of the law 'be fruitful and multiply,'" and, as she breeds several times a year and brings forth from a dozen to fourteen young ones each time, it is satisfactory to learn that the law of the struggle for existence keenly presses. Not only has the rat countless foes, but they also destroy and eat one another. It is also a curious fact, pointed out by J G Wood, that in a rat community the males are always in excess, which he explains as possibly due to the cannibalistic habits of the males.

There is one habit of rats which is of the utmost practical importance, viz, their habit of migrating if at all disturbed or made unhappy in their lairs. This unfortunately is one of the means by which plague is spread to other communities of men and rats. Buckland wrote

"It appears that rats, like many birds, fish, &c, are influenced to change their abode by want of food, by necessity of change of temperature, by a want of place for incubation, where they may obtain food for their young, and lastly, by their fear of man."

It, therefore, is of little use to drive the rats away by poisoning their holes or otherwise driving them away. As a practical measure of plague prevention it is preferable to get the rats caught alive and then killed,* and their bodies burnt, and thus, we are glad to observe, is what is being done in many municipalities.

We have written the above to call the attention of our readers to the importance of war against rats as one of the measures necessary to control the spread of plague. In so doing we, by no means, think of minimising the still paramount importance of general good sanitation and total improvement of the dwellings of the poor. Nor need we seriously consider the rat in his capacity, to use Buckland's words, as "a most useful servant, in his humble capacity of scavenger." That he does some good in this

way we need not deny, but if he is infected and likely to help in the spread of a fell disease like plague this should be no reason for not exterminating him, as Robert A Steindale wrote—"I confess to a love for all animals, but I draw the line at rats."*

PROBLEMS FOR THE NEW PLAGUE RESEARCH COMMITTEE

It will be admitted by all that though we know and understand much concerning plague yet the existing knowledge is not so precise and exact as to secure successful control.

In view of the fact that the Government of India have arranged for a new Committee for scientific research into plague problems it will be of value and interest to quote the following, from Dr W J Simpson's book on plague, which we have noticed in another column.

Systematic research is needed on the following questions—

- (1) The length of time an infected patient or infected animal retains infection.
- (2) What proportion of cases are traceable to house infection either in dwelling houses or workshops, and what proportion to other causes?
- (3) In the case of house infection what does it consist of, contaminated food, contaminated floors, or dust, or plague rats, plague insects, or other agents?
- (4) The history of plague cases as regards the source of their infection, and the conditions under which it took effect.
- (5) Whether rats or man are the chief disseminators of plague, and in what proportion?
- (6) Whether other animals are disseminators of plague, without being affected themselves, and in what way? It was a common belief in Europe, when plague used to prevail, that cats and dogs conveyed infection. If this is so, is it due to insects upon these animals?
- (7) Whether insects such as fleas, bugs, flies, &c, disseminate plague, and if so, the length of time they will retain infection.
- (8) What are the species of fleas on the rats, fowls, cats, dogs in the localities investigated, and which of them attack men?
- (9) What is the life-history of fleas and other insects in the affected locality in relation to epidemic and non epidemic season of plague and in their relationship to man and the domesticated animals?

* The Danysz bacillus may also be used but only if virulent. It has been successful at Cape Town and Odessa (see *Treatise on Plague*, p 396).

* It may not be out of place, nor unnecessary, to state that the little animal generally called a "Musk rat" (vern *Chachunder*) is not a rat at all, but a musk shrew (*Sorex carulescens*). This animal is from 6 to 7 inches long, and its tail about 4 inches. It is generally credited with being able to pass its subtle essence through the thick glass of a soda water bottle—a feat no chemist can perform, and one which naturalists like Jerdon and Steindale do not believe in. According to Hankin, this musk shrew is not attacked by plague.

(10) Whether there are other modes of dissemination besides animals and insects? Are rice stores and granaries, apart from their infected rats, disseminators of plague by the infection of their goods? How long does the bacillus live on fruits and on cooked food?

(11) How is the infection conveyed from man to man, and from animal to animal, except in pneumonic cases the infection does not appear to be direct. What are the indirect agencies, and in what way do they act?

(12) How is the infection from man to the rat, and in what way from rat to man? Is it by infected food, or by insect carriers? A similar question arises in regard to infection conveyed to and from poultry and other animals. Are vegetable feeders more susceptible to plague than eaters of a mixed diet?

(13) Does season affect the bacillus or its carriers, and in what way? To what is due the rapid loss of infection of plague after an epidemic has reached its height? Is it climate and due to growth of saprophytic organism destroying the bacillus, or rendering it attenuated in virulence, or is it due to some change in the life history of the carriers, such as fleas, etc.

(14) What is the reason for dormancy in non epidemic season, and what are the agents at work producing recrudescence?

(15) What are the best agents for destroying the bacillus or its carriers?

(16) What modification could be effected in the administration of Haffkine's prophylactic to make its use more general?

(17) By what means can the antidotal effect of Yersin's serum or that of others be rendered more powerful and curative against virulent plague?

It will be agreed that if one could fully and completely answer the above questions we would be in a position to very considerably control the movements of plague.

In Dr Simpson's book answers will be found, as far as our present knowledge goes, to the above questions.

Current Topics.

THE MALTA FEVER COMMISSION REPORT

WE have received a copy of the first part of the report of the Commission appointed by the Admiralty, War Office, and Government of Malta for the investigation of Mediterranean fever. This Commission was under the supervision of an Advisory Committee of the Royal Society, consisting of Colonel D. Bruce, R.A.M.C., chairman (the discoverer of the micrococcus melitensis), Fleet Surgeon Bassett-Smith, R.N., Dr. Klem, Dr. C. J. Martin (now on the Advisory Committee of the Plague Commission), and Dr. Sidney Martin. These gentlemen immediately appointed the investigating commission, consisting of Major W. H. Horrocks, R.A.M.C., Staff-Surgeon E. A. Shaw, R.N., and Dr. T. Zammit, of the Malta Board of

Health. Colonel Bruce went to Malta to start the inquiry, and Dr. Johnstone, of the Local Government Board, afterwards joined the Commission.

The present report consists of seven papers by members of the Commission, four of these papers being by Major Horrocks.

The present part-report does not attempt to sum up the conclusions of the Commission, but we are able to gather from a perusal of the papers some idea of the probable conclusions which will be arrived at. From two papers by Major Horrocks on the saprophytic existence of the *M. melitensis*, it is concluded that this organism can retain its vitality for six days in alkaline urine, and for 69 days when planted in a dry sterilized manured soil, and for 80 days on dry fabrics, such as blanket, khaki serge, and cotton cloth. It can also live in sterilized tap-water for 37 days. In Maltese soil, allowed to dry naturally it can survive for 43 days, and for a much longer period in a damp soil, exposure to the sun, however, kills it in a few hours.

The micrococcus can be isolated from the urine of patients, it failed to be isolated from the stools in 86 cases examined, and also from the sweat, though perspirations are such a prominent feature of the disease. The organism could not be recovered from the expired breath of patients, nor could it be detected in the sea-water of the Grand Harbour.

From a large number of carefully conducted experiments it is also concluded that the inhalation or the swallowing of infected dust will give rise to this fever in monkeys, and also that cultures of the micrococcus derived from a patient's urine can give rise to the disease in monkeys.

The careful experiments of Staff-Surgeon Gilmore, R.N., show that a few micrococci are found in even small quantities of peripheral blood, but, as the Editor remarks, their number is so small that it is extremely doubtful if this disease can be carried by biting insects. We may now quote *in extenso* the conclusions drawn as to the mode of entrance of the micrococcus melitensis into the body.

"There is experimental evidence to show that the *M. melitensis* when present in dry dust is capable of being absorbed by monkeys.

The path of absorption may be through the nares, throat, respiratory passages, and alimentary canal. When present in food, it is also taken into the system of monkeys, here, again, the path of absorption may be through the throat, as well as through the mucous membrane of the alimentary canal.

When transmitted through an unbroken mucous membrane, the process of absorption is comparatively slow, and under these conditions the wave of fever appears to be prolonged. The long and variable incubation period observed in monkeys infected through an unbroken mucous membrane is frequently observed in man infected under natural conditions.

When the *M. melitensis* is absorbed through a crack in a mucous membrane or in the skin, or is injected subcutaneously, the absorption is rapid, and the incubation period in monkeys varies from five to seven days.

The curve of fever is characterised by a rapid rise usually followed by a rapid fall. These acute infections have also been observed in man infected under the same conditions, but the period of incubation appears to be longer in man than in the monkey.

The history of monkeys, Nos 69 and 47, shows that healthy monkeys may become infected by urine secreted by monkeys suffering from Mediterranean fever. Just as in the case of man, the *M. melitensis* is excreted in the urine of infected monkeys. And it seems probable that healthy monkeys walking in the infected secretion convey the specific microbe into the mouth by means of the paws.

Infection by means of urine secreted by cases of Mediterranean fever readily explains the cases of Mediterranean fever which appear to arise spontaneously in hospitals. In the absence of specific knowledge as to the mode of the secretion of the *M. melitensis* from the human body, sufficient care has hitherto not been taken to sterilise bedpans, urine bottles and sheets soiled by cases of Mediterranean fever.

There is no evidence that Mediterranean fever can be contracted by contact with cutaneous substances, uncontaminated by urine.

The experiments made with *stegomyia fasciata* do not support the result obtained by Dr Zammit.

The report is a valuable one, and the amount so far published is sufficient to lead to the hope that the Commission will be able to make valuable additions to our knowledge of this interesting and important disease.

"POST OFFICE QUININE"

THE success of the action of Government in making pure quinine available in every village in India is now assured, the amount of quinine now distributed by village post office throughout the malarious parts of India is very large, though it only reaches but a minority of the population. A case has recently been before the courts in the malarious district of Backergunge which shows that this method of selling quinine has "caught on," and the sincerest form of flattery has been paid to it, viz, imitation.

A small village grocer seeing the considerable sales of the pure quinine from a local post office conceived the project of imitating the packets and selling them for his own profit. We may mention that the profit to Government derived from the sale of these "pice packets" is now nothing, the increase of the dose of quinine to seven grains has done away with any profit, and quite properly so, for the object of the sale was to benefit the people and not to make money.

This village grocer not only imitated the printing and the Royal Arms on the packet, but instead of giving quinine, he gave only a trace of quinine, some white arsenic, and starchy matter. This was proved on chemical analysis of several of these fraudulent packets purchased from his shop at different times.

The accused was tried before the Deputy Magistrate of Backergunge, and found guilty under sections 276, 275 and 274 of I P Code, and under sections 6, 7, 107, of the Merchandise Marks Act, and was sentenced to rigorous im-

prisonment for six months, with other sentences to run concurrently, and this judgment on appeal was upheld by the Sessions Judge.

The case is of importance, and should be known all over India. The sale of these pice packets of pure quinine is a great boon to the community in malarial districts, and nothing would be more prejudicial to the spread of this useful scheme than that fraudulent, or dangerous or even useless imitations should be sold as substitutes for the genuine quinine. We agree therefore with the Sessions Judge that the sentence in this case erred on the side of leniency. It is, however, satisfactory that the culprit was caught and punished.

MALIGNANT DISEASE IN CEYLON

AMONG the many interesting articles in the Journal of the Ceylon Branch of the British Medical Association is one on the incidence of cancer in Ceylon by Dr A G Chalmers, the Registrar of the Ceylon Medical College, which is of interest in view of the various articles on cancer prevalence in India which we have from time to time published.

Dr Chalmers discusses the question of the incidence of malignant disease among three chief races in Ceylon, viz, the Sinhalese, the Tamils and the Burghers. Taking the population of Sinhalese as about 2½ million, the incidence of cancer is put at 1 in 16,000, or about 1 in 13,300 in males and 1 in 20,000 in females, and considering the proportion of the two sexes it is said that cancer is twice as common in males as in females. The average age of cases analysed is about 44 years in both sexes.

In Tamils the average in males was about 1 in 12,000, and in females 1 in 1,500. In the Burghers, whose comparative number in the population is small, the incidence is given as 1 in 7,000, 1 in 6,000 men, 1 in 9,000 females.

The peculiar feature is that men suffer more than the women. As the question of the relative attendance at hospitals in both sexes is not mentioned, it may be that no difference exists in Ceylon, but on this point we are doubtful.

Dr Chalmers compares the incidence in England with that in Ceylon as follows —

In England	1 in 1,200
In Sinhalese	1 in 16,000
In Tamils	1 in 12,000
In Burghers	1 in 7,000

Or about 13 times as much in England as in Ceylon.

We may agree with Dr Chalmers that cancer is not one of the great diseases of Ceylon, and it is the opinion of medical men there that it is not increasing. As in Madras, as Capt Niblock, FMS, has pointed out, a considerable amount of cancer in the parts associated with mastication is attributed to the irritation caused by the habit of chewing betel, the lime having an irritant effect. Cancer of the penis is common, and circumcision is not practised as a rule by

Sinhalese or Tamils Cancer of the uterus is common, but cancer of the breast is rare Dr Chalmers would attribute this to the absence of corsets, but is cancer of the breast so relatively rare among Indian women who are equally free from corsets?

In another paper Dr Chalmers has discussed the incidence of sarcoma in Ceylon From the hospital statistics upon which the author has based his conclusions, it appears that sarcoma is a very rare disease, there being only about 23 cases per annum in the whole island It is very much less common than cancer, and occurs too at a much earlier age, viz, 26 years

HYMENOLEPSIS TAPEWORMS IN MAN

We have already called attention (February, p 71) to the valuable monographs issued by the Hygienic Laboratory of the Public Health and Marine Hospital Service of the United States, and recently reviewed a complete and valuable monograph on the trematode parasites of man The present pamphlet, bulletin No 18, gives a most exhaustive and complete account of the tapeworms of the genus *hymenolepis* parasite in man These most valuable pamphlets are not for sale, but are obtainable on application to the Surgeon-General, U S Public Health and Marine Hospital Service, Washington, DC

The tapeworms of the genus *hymenolepis* have received but scant attention in ordinary medical text-books, most of its species are found in insectivorous mammals and birds, but three species, *H nana*, *H diminuta*, and *H lanceolata*, are found in man The first is the most important and most frequent It has been recognised in the United States In Sicily it is stated that as many as ten per cent of children are infected with it, but it has been found in most countries of Europe, as well as in Japan, Brazil and Argentina It was first discovered at Cairo by Bilharz in 1851, it is known as the dwarf tapeworm, and owing to its small size its recognition chiefly depends upon the discovery of the eggs in the feces Its habitat is the small intestine of the brown or Norway rat (*Mus decumanus*), the black rats, the field and house mice, and man The embryo is swallowed, and after hatching enters a villus of the small intestine, where it transforms into a caecocystis, which in turn falls into the lumen of the intestine, and becomes adult The symptoms produced much resemble those of other intestinal worms, and it usually is met along with other intestinal parasites Malefern is the only drug which has any degree of success in the treatment of this infection The mode of infection is probably by rats and mice, that is food which has been touched or nibbled at by rats or mice

The next parasite of this species is the flavopunctate tapeworm, *hymenolepis diminuta*, originally described by Rudolphi in 1819 It is a long but very narrow worm, 8 to 12 inches long but only about $\frac{1}{8}$ inch broad Its habitat is in

insects, the diagnosis usually made from the appearance of the ova It is chiefly found in the larvae of the meal moth, *asopia farinalis*, in beetles and in earwigs Prophylaxis depends in avoiding the ingestion of these insects, and by keeping food protected from them Almost any vermifuge or cathartic is sufficient to expel the parasite

The third tapeworm of this genus is *hymenolepis lanceolata*, long known as a parasite of geese and ducks, but only recently discovered in man It is very rare in man, only one case having been reported Its lance-shaped head is characteristic, it is about 2 inches long and a quarter to half an inch broad, tapering to a fine lance-shaped head

This very complete monograph of 138 pages sums up all that is known on these three tapeworms, and contains a very complete bibliography

THE THOMPSON YATES AND JOHNSTON LABORATORIES REPORT

The first part of vol vi (1905) of the reports of this now well-known laboratory has been received It deals almost entirely with work done by the staff of the Liverpool School of Tropical Medicine The first 115 pages deal with the important subject of human trypanosomiasis, the first report has already been published (*B M J*, 23rd Jan '04) The second report of the Congo Expedition up to May 1904 is now given, and gives a result of the work done by members of the expedition in the Congo region, especially with regard to sleeping sickness, and its connection with trypanosome infection

It appears that human trypanosomiasis may be divided (like ancient Gaul) into three parts

A Cases with no definite symptoms of illness

B Cases with few symptoms

C Fatal cases, showing well marked symptoms, the most notable being fever, lassitude, weakness, and wasting

Cases come under C type in which no sleep symptoms were ever present, hence type C is subdivided into (1) fatal cases showing no sleep symptoms, and (6) fatal case showing sleep symptoms

Of the A type are persons at work and apparently in good health, but whose blood shows *filaria diurna*, *filaria pestans*, and trypanosomes

Of the B type are those with few signs of illness, and not yet definitely believed by their friends to be suffering from sleeping sickness, patients only complain of fatigue, dulness, apathy, vague pains, or some complication or bowel-complaints or bronchitis, trypanosomes are present in the blood, and there is irregular low pyrexia

In the C type those without the sleeping symptom, complain of weakness, emaciation, enlargement of lymphatic glands. There are also increased reflexes, slight bronchitis and

digestive trouble Intelligence dull, expression vacant The next type shows definite sleepy symptoms, that is, a constant desire for sleep, and irregular fever is more pronounced

It will be seen that the Congo sickness differs from the epidemic form of sleeping sickness, as seen in Uganda, in the large number of cases infected by trypanosomes, who show no characteristic 'sleeping' symptoms

Death in human trypanosomiasis is due not directly to the trypanosomes, but to complications as purulent meningitis, pneumonia, dysentery

Other valuable articles in this report are, on the Congo floor maggot, the cerebro-spinal fluid in sleeping sickness, and cases of trypanosomiasis in Europeans There is also a valuable supplementary note on the Tsetse flies (genus *glossina*) by Mr E E Austen of the British Museum

Dr J W W Stephens describes a new hæmopigearine in an African toad. The same writer also gives two cases of intestinal myiasis in two Liverpool children Dr D E Shipley describes a new human African parasite, called *Cladorchis Watsoni*, an intestinal parasite, whose occasional host is man Dr Everett Dutton describes the filaria of the African Swift, *cypselus affinis*, whose habitat is the lymph of that bird, and of which the louse is the intermediate host

The whole volume is valuable and an evidence of the high standard of scientific work done in these laboratories

THE TREATMENT OF SPLENIC CACHEXIAS

WE quote the following conclusions from a valuable article by Leonard Rogers, I.M.S., in the *British Medical Journal* It emphasises the value of large and continued doses of quinine in these cases, supplemented by the ingestion of bone marrow Many years ago before the discovery of the Leishman-Donovan bodies, we used bone marrow with success in those cases called "malarial cachexia," obtaining it direct from the butchers, by splitting up the long bones of sheep and goats It should not be difficult to get a regular supply of such bones, for tabloids, admirable as they are, are too expensive for general hospital use We note in passing that Rogers recognises the two cachexias, *viz*, due to Leishman-Donovan infection and the true malarial cachexia—a point we referred to in our last issue

"1 A very marked decrease in the leucocytes is always found in uncomplicated cases of cachexial fever, and when they number below 2,000 per c cu, this is almost diagnostic of the disease, but may rarely occur in true malarial cachexia

2 In cachexial fever the white corpuscles are reduced to a greater degree than the red, so that the ratio falls below 1 to 1,000 in all uncomplicated progressive cases This is rarely so in true malarial cachexia, while a reduction in the ratio to below 1 to 1,500 appears to be quite diagnostic of cachexial from other Indian fevers

3 The most marked degrees of reduction of the leucocytes, and especially of the polynuclears, is of bad prognostic import, and *vice versa*

4 Red marrow tabloids are of great value in increasing the leucocytes, and this increase may take place during the continuance for months of intermittent fever, and be then followed by cessation of the fever and complete recovery

5 High remittent fever is accompanied by progressive deterioration of the blood and general condition, but it may be often to a large extent reduced to the less injurious intermittent form by continued large doses of quinine, combined with red marrow The best results yet reported have been obtained by those who carry out vigorous quinine treatment "

GENUINE GHEE

IN a rather discursive paper read at the Bombay Medical and Physical Society on food and drug adulteration in Bombay, Mr D R Bardi, the Senior Instructor in Chemistry in the Grant Medical College, Bombay, gives the following standard for genuine ghee

"1 The specific gravity at 100° F should be about 904

2 The melting point should be between 29°4 c to 34°7 c

3 The percentage of the soluble fatty acids should be from 5 to 7

4 The percentage of insoluble fatty acids, *i.e.*, Hehner value, should be from 86 to 89

5 Reichert-Miessl value should be between 25 to 31

6 Hubl, or Iodine value, should be between 19 to 37

7 The values of the butyro-refractometric must not exceed 52.5 at a temperature of 25° c

8 The deviation by the oleo-refractometric should be—30 An analysis of 325 samples of ghee showed that—

A *Genuine Ghee*, *i.e.*, ghee fairly free from adulteration yielded (a) over 5 per cent of soluble fatty acids, and in 257 samples it ranged from 5.25 to 6.5 per cent with 5.85 per cent as an average, in one sample of undoubtedly pure ghee it was 5.90 per cent,

(b) the melting point in 257 samples was from 96°F to 107°F, with an average of 100°F, and

(c) the Sp Gr at 120° F ranged from 896.6 to 900.4 with an average of 898.5

B *Non-genuine Ghee*, in 68 adulterated samples, yielded 2.07 to 3.46 per cent of soluble fatty acids

A NEW BLOOD PARASITE OF MAMMALS

THE interesting memoir* in which Captain James, I.M.S., describes a hitherto unknown blood parasite of dogs affords evidence that our knowledge concerning even the protozoal blood parasites of warm-blooded animals is by no means complete and leads us to conjecture that

* Scientific Memoirs by officers of the Sanitary and Medical Departments of the Government of India. New Series No 14.

even concerning the blood parasites of man we may yet have much to learn. In searching the blood of men and animals for protozoal parasites, we are perhaps too prone to omit to examine the leucocytes carefully; it seems so unlikely that they should act as the host cells of a parasite. But a principal point of interest about this parasite which was apparently first discovered by Dr C Bentley and which Captain S P James here describes is the fact that it is found only in leucocytes. It is a *Leucocytozoon*. Parasites of the leucocytes have never before been found in mammals, and it is very doubtful whether the so-called leucocytozoa found in birds by Danilewsky and others are parasites of the leucocytes at all. Such at least is the opinion of Laveran, Mesnil, and Schaudinn. It appears that the *Leucocytozoon canis* (the name which Captain James has given to the parasite he describes) has some affinities with the interesting yet little known group of hæmosporidia called hæmogregarines, but the latter are parasites of the red blood corpuscles and, moreover, have never yet been found except in cold-blooded vertebrates. Thus, the parasite of the white blood corpuscles of dogs represents, as Captain James says, a hitherto entirely unknown form of mammalian blood infection, and there is no doubt that it will stand as the type of a new genus among protozoal blood parasites.

THE KASHMIR MISSION HOSPITAL

THE report for the year 1904 is as usual a record of a large amount of good medical and surgical work. During the year there was an attendance of over 16,700 new patients, and no less than 3,717 operations. There are always a large number of operations on the eye, viz., 123 for cataract, 610 for entropion and trichiasis, 213 for pterygium. Dr Neve comments upon the number of cases of pterygium, which he thinks must be "due to some racial peculiarity." It is certainly a very common complaint in India. Out of 268 tumours excised 59 were epitheliomata or "Kangri-burn" cancer. Dr Neve notices the commonness of ascites due to hepatic cirrhosis, but he has not obtained any results of value from Talma's operation. Laparotomy is making but slow progress, cases are brought in too late and a bad result deters others. However, there were two successful ovariectomies.

"The hospital" (says Dr Neve), is "a dumping ground for cases of hopeless disease, and for the final and appalling results of the practice of native doctors," so it is surprising that the mortality statistics are so low.

THE March number of *The Practitioner* is specially devoted to the subject of puerperal fever. Among the articles is one by Dr Herman, on the clinical aspects of puerperal fever, which gives a clear and concise account

of the various forms in which the disease may present itself. This is followed by a short consideration of the treatment of the disease by Dr Galabin, in which the author in common with most modern authorities condemns the routine use of the curette in cases of septic endometritis.

Among the other articles are the Prevention of Puerperal Fever, by Dr Berry Hart, the Prevention of Puerperal Fever in London Lying-in Hospitals, by Dr William Gow, Asepsis in the Rotunda Hospital, by Dr Hasting Tweedy, the Pathology of Puerperal Fevers, by Mr Alexander Foulerton, the Blood in Puerperal Fever, by Dr D'Este Emery, etc.

It will be seen that the subject is treated from many different standpoints, and by various authors.

IN a recent issue we referred to the organisation of the medical arrangements for the control of sickness among workers on the new Panama Canal. We learn from the American medical papers that this important sanitary work has been to a very large extent obstructed and rendered futile by a number of ignorant lay Commissioners, and President Roosevelt has had many hard things said against him for their appointment.

A CORRESPONDENT asks for information as to the sort of questions asked at the newly instituted examination for Lieutenants, I.M.S., before promotion, in Military Law and Regulations. Perhaps some officer who has recently passed this examination could write and inform us as to what candidates are expected to know.

Reviews.

A Treatise on Plague—By W J SIMPSON, M.D., F.R.C.P. Cambridge, University Press, 1905. Price 16s.

WE have no hesitation in recommending this Treatise on Plague by Dr W J Simpson as the most complete and comprehensive volume dealing with the subject which has yet seen the light. The book has been written at the request of the Syndics of the Cambridge University Press with the object of bringing within a modern compass the principal facts concerning plague from its historical, epidemiological, clinical, therapeutic and preventive aspects. Thus we think the author has entirely succeeded in doing. To those acquainted with the now very large literature of plague there will be little or nothing in the volume, which is new, but it is a supreme advantage to the sanitarian to have in one volume such a comprehensive, detailed and thorough review of the many problems

introduced by plague. The author himself has had a wide experience of the disease, in India, in China and in Cape Colony, he has read and digested the multifarious reports from every part of the world infected by the present pandemic, and the result is that the reader is presented with a large subject treated in reasonable compass. The style of the book is not heavy. It is easy reading, and the printing is good.

The first two chapters deal with plague in its historical aspect, in ancient times in Europe, Asia, and in India. This is not only interesting but valuable, and shows that the same plague problems, the same administrative difficulties confronted the nations of older times as now, still confront the modern sanitary authorities.

The present pandemic in India, though it has not yet reached the appalling total fatality of some of the great epidemics of ancient days, yet is fast mounting up, and with an Indian death-rate, at the time of writing, of 30,000 to 40,000 a week, the totals will soon equal or surpass the most devastating figures of the older epidemics. In Bombay already the total deaths surpass that of any ancient epidemic in any single city, except those of Constantinople and Grand Cairo.

In these two chapters will be found a complete review of plague from the most ancient times down to near the end of the 19th century.

The present pandemic is traced back to the Province of Yunnan, where plague has been known to have persisted since 1871, from here it spread over Southern China, affecting Hongkong. The disease very severely attacked Canton in 1894, and very soon after it was discovered in Hongkong, and in that year, on the 14th June, the bacillus was discovered by Dr S Kitasato of Tokio, a discovery independently made and confirmed shortly after by Yersin in Hongkong.

The precise manner and date of the arrival of plague infection in Bombay are unknown, but it is an undoubted fact that as early as March 1896 plague existed in Bombay, and the first cases were recognised in Mandvi district of that city in August. The rats were then dying in numbers. It was not till 23rd September that Dr A G Viegas drew emphatic attention to the disease, and the existence of the disease was officially confirmed, after bacteriological examination by Haffkine on 13th October. Plague had then been absent from Bombay since 1702, or a period of 194 years.

The following figures enable us to realise the rapid and persistent progress of the epidemic. The reported deaths being as follows, in round numbers —

From September 1896 till end of 1897 total deaths	57,960
Total for year	
1898	118,100
1899	134,100
1900	91,000
1901	232,490
1902	574,490
1903	853,570
1904	1,040,420

In the Punjab especially the total increase has been enormous and rapid —

1898	1871 cases reported	1901	18,877 cases reported
1899	235 " "	1902	221,707 " "
1900	525 " "	1903	210,188 " "
		1904	354,053 " "

Dr Simpson then traces the spread of the disease to Arabia, South Africa, South America, United States, Australia, the Mediterranean countries and Europe. In 1897 a new epidemic centre was discovered by Koch and Zupitza in Uganda and German East Africa.

Chapter IV deals with the nature of the infection, and gives a full account of the forms of the bacillus, its vitality and its varying virulence. The next chapter is of special interest and deals with epizootics of plague, a fact known for many thousand years. It reviews the history of plague in animals from ancient days, down to the recently published report of Dr William Hunter in Hongkong. It shows how that plague can attack all sorts of animals, domestic and wild, but points to the remarkable fact that in the present pandemic the devastation of the disease in rats alone has been of importance.

In the sixth chapter the different views as regards the etiology of plague are discussed, the effects of war, of volcanic eruptions, and abnormal conditions of weather are noted. The next chapter is an important one, the powerful influence of season is discussed, the effects of high and low aerial temperatures, and the conclusion is reached that it is probable that the varying condition of the soil and its fluctuating temperature may have an effect on microbic and insect life, thereby influencing the spread of plague. It is a matter of greatest importance to ascertain, for example, why at the decline of an epidemic infected articles and houses lose their power of infection for the time being till the favourable season comes round again. Numerous examples of this are given, and the phenomenon is not confined to plague alone. This is one of the problems for the Scientific Research Committee.

The variation in virulence of plague epidemics is dealt with in Chapter VIII, and with it the question of individual and racial susceptibility.

We have now exhausted the limits of our space, but propose in an early issue to complete our notice of this most valuable book. The remaining dozen chapters are no less interesting than those we have briefly commented upon.

The Practical Study of Malaria and other Blood Parasites — By J W W STEPHENS, M D, and Lieut S R CHRISTOPHERS, I M S London. Williams and Norgate (for the University Press of Liverpool) 2nd Edition Octavo Price 12s 6d net.

WITHIN a year of the publication of the first edition of this valuable book a second revised and enlarged edition appears. The present

edition contains six coloured plates and one hundred and three illustrations in the text

The progress in the study of blood parasites has been so rapid that this second edition contains much new matter, on new anophelines, and mosquito genera, on details of mosquito life, and a compact and valuable description of many new hæmogregarines, trypanosomata, &c, and also an account of Schaudinn's remarkable work on 'Halteridium'

A good account of what is known of the Leishman-Donovan bodies* is given, and it is noted that the 'same' parasites are found in oriental sore, &c, though in view of James' recent monograph, it would now be safer to say 'similar' or bodies indistinguishable from those discovered by Leishman in European soldiers and by Donovan in natives of India. The plate illustrating these bodies is very good. We note that, one of the authors, Christophers has confirmed Rogers' observation that flagellates are formed in the development of these bodies, but there is added "these flagellates are certainly not trypanosomes"

The account of the trypanosomes is very good, though of course brief, also that on spirillar fever and on filaria

A large portion of the book is given over to malaria, the examination of normal blood, forms of the parasite, subsidiary signs of malaria, examination of tissues and smears. Several chapters are devoted to a very compact and clear account of the life history of mosquitoes, their identification, classification, &c. In fact an immense amount of information about these pests is contained in this volume

We can strongly recommend this book as the best and most practical manual yet published for research in tropical diseases. Its publication should stimulate further research, for no one after reading it need be deterred from attempting to do something. For this reason we strongly commend this second edition to our readers. The get-up of this book is good, and the plates and illustrations in the text are both numerous and admirably executed

The Occult Review.—London William Rider & Sons, Ltd., 164, Aldersgate Street. Price 6d monthly. Edited by Ralph Shirley

We have received an early copy of a new monthly magazine devoted to the investigation of supernormal phenomena, and the study of psychological problems

The recent adhesion of a man so well known in the scientific world as Sir Oliver Lodge has

* Till the question of the real nature of these bodies is settled it is best to retain the expressions "Leishman Donovan Infection" and "cachexial fever." We use both names because while Leishman first discovered the bodies in a European soldier, Donovan found them in natives of Madras, which has led to their discovery in *Kala Azar*, &c. Just at present the exact nature of the various trypanosomes and even of some forms of what we call the malarial parasite are *sub judice*, and in view of possible fresh discoveries it is rash to rush to conclusions. Possibly the whole nomenclature of blood parasites will have to be revised.

attracted the attention of many to the views of the Psychical Society. We confess ourselves as not in sympathy with the views, but all will readily admit that there are more things than are dreamt of in any of our philosophies

At any rate for those who are attracted to the investigation of the occult we can commend this periodical. It is soberly written, and unmarked by extreme views. The Editorial deals with an announcement made by the American Institute for Scientific Research, *viz*, that an institution is to be established on the model of Charcot's famous Salpêtrière Hospital in Paris for the physical treatment of disease by hypnotism and for the "cure of delusions and criminal tendencies." It is hoped that hypnotic suggestion, under favourable circumstances, might play a part in combating criminal tendencies. An interesting and characteristically rambling article by Andrew Lang is worth reading, as everything that Andrew Lang writes is. It deals with the case of a "haunted house" in Ireland, or as the writer prefers to call it "a local centre of permanent possibilities of hallucination." Mrs Campbell-Praed writes of "World-memory and pre-existence," and B G Evans gives an account of the appearance of "Lights" in various parts of emotional Wales, which are said to be connected in some way with the revivalist efforts of a lady named Mrs Jones of Eglwys. These "lights" have attracted the attention of correspondents of certain halfpenny and Sunday newspapers. What these mysterious "lights" are no one knows, though many people have seen them, especially after coming home in an emotional frame of mind from the exciting scenes which are part and parcel of Welsh revivalism. It is noted, however, that the same sort of "Lights" appeared to Mahomed, and the same were "seen" in the revival movement of 1859 in England. Other articles of interest are on Astrology in Shakespeare, and on "the conflict between religious and scientific thought"

We can commend the new Magazine to all who are interested in the phenomena of the occult. It is obtainable from Messrs Thacker, Spink & Co, Calcutta

Pathological Technique A practical Manual for Works in Pathological Histology and Bacteriology, including Directions for the performance of Autopsies and for Clinical Diagnosis by Laboratory Methods by F B MALLORY, M D, Associate Professor of Pathology, and J H WRIGHT, M D, Instructor of Pathology, Harvard University Medical School. Octavo, 409 pages, 156 Illustrations. Third Edition. Revised and enlarged. Price \$3. W B Saunders & Co

THE book consists of three parts: the first deals with *post-mortem* examinations, the second with bacteriological methods, and the third with histological methods, and the intention of the authors has been to present in one book these three methods of solving the problem

presented to the pathologist when he sets to work to determine the cause of death in any particular case

A matter which strikes one forcibly and repeatedly in reading the book is its thoroughly practical nature

The part on Bacteriological Methods is divided into four sections the first on Culture Media, in the course of which the authors describe a simple method of preparing coagulated blood-serum tubes, a medium which they consider one of the most generally useful, the second on bacteriological examinations, the third on the methods of studying bacteria in culture, in which there are several ingenious and original ones, especially for anaerobic work, and fourthly a section on special bacteriology. It is in the matter of the serum-reaction that we have our only fault to find with the book, the method described is unsatisfactory because inexact, the dilution being only roughly carried out and not sufficiently accurately measured. The authors are evidently content with a dilution of 1 in 40 as evidence of the existence of typhoid fever, nor can we find any reference to the possible error introduced by a previous anti-typhoid inoculation

In part 3 on Histological Methods the questions of the special conditions under which the various hardening and staining reagents are indicated are very fully detailed, including that of every tissue separately, and of mitosis, cancer bodies and special kinds of cells, including the malarial parasites. The book ends with a section on clinical pathology, such as the examination of pieces of skin removed during life, of uterine scrapings, of fluids obtained by puncture (including lumbar puncture) with the knowledge obtained by microscopy, or the isolation of the tubercle bacillus by digestion of the material in which it is embedded, and cytodiagnosis, or the identification of the cause of an exudation by the cells which it contains, of sputum, of stomach contents, of urine and of faeces

The book is well printed and bound, and the illustrations, many of which are original, are very good. We consider the book an acquisition to the library of any pathologist. Every Civil Surgeon in India is perforce a pathologist.

Examination of the Urine—By G. A. DE SANTOS SAXE, M.D., Pathologist to the Columbus Hospital, New York City. A 12mo volume of 391 pages, 76 figures, 8 coloured plates. W. B. Saunders & Co. Price \$1.50

It is difficult to avoid the use of superlatives in reviewing this book. It is a clear, complete, and concise exposition of the subject and is brought quite up to date. A bare enumeration of its contents is as follows. After a short preliminary clearing of the ground the author deals very fully with the physical properties of the urine, and then passes to consider its "chemic" examination. The various proteids which may

be found in urine are detailed, and their relative importance, detection and differentiation fully described. The carbohydrates and their allies are next dealt with in the same exhaustive manner, and then urea and its congeners, and here is to be found a description of the quantitative test for the purin bodies, a matter likely to take an important place in urinalysis, and which is moreover very simple. The acetone group of substances is next considered and the diazo-reaction explained.

The microscopic examination of the urine is taken up with equal fulness and method, and the subject is fully illustrated by 26 figures and 6 coloured plates. The author lays special stress upon the identification of individual cells coming from different parts of the urinary and genital tract, and on the inferences to be drawn from their presence. An appendix describes the method of routine examination, and the apparatus and reagents required. The book contains misprints at pages 94 and 326, which will doubtless be corrected in a subsequent edition. They will not however cause confusion. The book is handsomely bound in soft leather, and printed on good paper with round corners. We have said enough to show the range of the book, we repeat that the method in which the subject has been treated is altogether admirable. We have read the book with great pleasure, and thoroughly recommend it as complete and essentially practical.

A Text-Book of Materia Medica.—For Pharmaceutical and Medical Schools, and for home study. By ROBERT A. HATCHER, Ph.D., M.D., and TORALD SOLLMAN, M.D. A 12mo volume of 410 pages, 56 figs. W. B. Saunders & Co. Price \$2.00

In this volume only the organic portion of the study of Materia Medica is considered. The book is written with the object of popularising the Laboratory method in the study of Materia Medica. The authors point out in the preface the great superiority of the objective over the didactic method in the study of any subject not only as a matter of training but as making the material more interesting and impressive, and they urge rightly that such is especially the case in attempting to learn Materia Medica, seeing that the almost proverbial subject can be directly traced to the neglect of objective study. Accordingly they set to work to devise a series of practical experiments by means of which the student might have the essential characteristics of drugs impressed upon his memory by means of a careful study of these in three directions, the naked eye study of the crude drugs, that of their microscopic appearances, and that of their chemic reactions.

They have found that by elimination of non-essentials the new method of instruction demanded little more time than the old, an important point in these days when the curriculum of the medical student is constantly tending to lengthen.

We cannot conceive a better way of getting rid of the tedious boredom of listening to a course of *Materia Medica* lectures than by substituting for them a practical course such as that laid down in this little book, truly a clothing of the dry bones of the subject with a little living flesh of interest, and a change likely to take it out of the category of those which are forgotten as the examination is over. We can recommend the book and its guiding principle to lecturers on *Materia Medica*. It is well bound in soft leather and the illustrations are very good. They consist principally of the microscopic appearances of sections of medicinal plants.

A Text-Book of Mechano-Therapy (Massage and Medical Gymnastics).—By AXEL V. GRAFSTRÖM, B.Sc., M.D. 12mo of 200 pages, 28 figures. W. B. Saunders & Co. 1s. Second Edition.

THE book consists, in essence, of two parts, although it is not actually so divided, the first treats of the mechanical methods adopted in massage and in medical gymnastics, is fully illustrated by original drawings, and will completely fulfil the intention of the author, that it should be useful to medical students, trained nurses, and medical gymnasts. A chapter on the effects of movements is sound reading. The rest of the book deals with the treatment by these means of diseases of the various organs, and here are met with statements which appear to be imperfectly founded on physiological knowledge, and in some instances to be in direct opposition to this. Such statements are—"Vibration imitates almost to perfection the bioplastic movements, and so becomes the most natural procedure of massage." "Local massage of the chest will dissolve the mucus and aid the expectoration." Had the author confined himself to a statement of observed results instead of attempting to offer explanations which are likely to mislead the imperfectly medically educated persons for whom it is intended, the book would, we think, have been more useful.

Practical Application of Röntgen Rays in Therapeutics and Diagnosis.—By WILLIAM ALLEN PUSEY, A.M., M.D., and EUGENE W. CALDWELL. 690 octavo pages, 195 illustrations. W. B. Saunders & Co.

THIS, the second edition of the book, has been considerably enlarged. It is in two parts, the first by Caldwell on X-ray apparatus and its use in diagnosis, and the second on the therapeutic application of X-ray.

In the first part all details of the various forms of apparatus by which X-ray tubes can be excited are minutely described, and the differences in the tubes themselves, and the reasons for these, are stated. These chapters are full of practical points and furnish precisely the information which will be desired by a civil surgeon who wishes to set up an X-ray apparatus. He

will find in the chapter on static machines and their management great aid in choosing the apparatus which he will probably have to decide upon as suitable for use in most civil stations. In the second part, that on the therapeutic application of the X-rays, there is much of extreme interest. Professor Pusey deals not only with the clinical aspects of the subject, which he copiously illustrates with photographs of lesions taken at intervals of time, forming a convincing adjunct to his written descriptions of the cases, but also with the pathological aspects which are illustrated by micro-photographs of sections of several portions cut out from the edges of a "carcinomatous ulcer" at different stages of its progress towards cure under the influence of X-rays. To read the description of a case, to see the photographs showing its naked-eye appearances on different dates, and to be presented at the same time with micro-photographs showing the minute changes which are taking place, the disappearance of the invading columns of cells, and their replacement by connective tissue, is to be convinced that in X-rays, if properly applied, we have a very powerful remedial agent. The variety of case which may be so benefited is very considerable. We have only one adverse suggestion to make, and this is that the book is very bulky. It is printed, both as regards type and pictures, on thick paper, a fact which probably is one of the chief reasons that the latter are so excellently reproduced, but which is a distinct disadvantage to the migratory medical man in India. It is, however, a minor one, and we feel sure that the purchaser of the book will feel that he has made a very excellent bargain.

Diseases of the Nose and Throat.—By D. BRADEN KYLE, M.D., Professor of Laryngology and Rhinology, Jefferson Medical College, Philadelphia, &c. Third Edition. 8vo pp 669, with 175 illustrations and 6 chromo lithographic plates. W. B. Saunders & Co., 1904. Cloth \$ 4.00 net. Sheep, or half-morocco, \$ 5.00 net.

THIS is quite one of the best text-books on Diseases of the Nose and Throat in the English language. Though its size is considerable there is very little redundant matter in it. Its style is so good and its descriptions so clear and practical that it is a pleasure to read it. Unlike some American text-books moreover an added pleasure is to have no fault to find with *ars literarum recte ordinandarum*.

The book has reached its third edition so no detailed review of it is necessary. Its position is established and deservedly. The most important additions in this edition are in the chapters on keratosis, epidemic influenza, Ger-suny's paraffin method for correcting nasal deformities and on the treatment of carcinoma by the X-rays. For paraffin injections, Dr Kyle prefers Quinlan's syringe, which is an ordinary glass antitoxin syringe with a needle of large

calibre and solid piston. The syringe is partly encased in a metallic hood through which warm water circulates to keep the paraffin liquid. The author particularly objects to the paraffin being suddenly cooled, *e.g.*, by ice, after injection, and allows it to cool gradually only to the body temperature by applying heat after injection. If any scar tissue is present or any ulceration within the nasal cavity the method is not applicable. The description of intubation of the larynx is particularly good and Thorner's modifications of Dwyer's instruments described. The limitations and difficulties of intubation are fully recognised. Professor W. W. Keen contributes a short but valuable chapter on operations, describing only thyrotomy and his own methods of partial and complete laryngectomy, all other operations on the nose and throat being described in the chapters dealing with the diseases necessitating them. The headings of the chapters would bear revision, no less than seven of them, in different parts of the work being 'Diseases of the anterior nasal cavities'. The author has devoted much research to the saliva and its reactions—*Sialosemeriology* as he calls it, and has reproduced his results in an interesting chapter. He has come to the conclusion that in many cases of hay fever the symptoms are the result of alterations in the reaction of the saliva and he has in many instances been able to partially or wholly arrest the attack by rapidly changing the reaction. The Indian and Negro are, he says, apparently immune to hay fever, and cases occurring in Asia and Africa are usually confined to English and Americans.

The work is very complete and up to date in all respects. The index is full and accurate as is usual with their publications. Messrs Saunders & Co have produced the book in excellent style and with good illustrations and binding.

Correspondence

SPIRILLAR FEVER IN INDIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—I have lately read Capt. Browne's note in the *B M J* for March 11th, 1905, regarding the finding of a spirillum in the blood of a man suffering from fever in Nowshera. I hope he or some one else will seriously take up the study of the fevers in the Peshawar Valley. During the hot weather of 1902, and again during the early spring of 1903, I was in Peshawar and examined a very large number of blood films from such cases of fever as I came across.

In a fair proportion of cases benign tertian parasites, and in a smaller number malignant parasites were found, but in quite a number I failed to find any parasites after even prolonged search.

Of course some of these cases may have been malarial, but have been previously dosed with quinine, though my subordinates had strict orders not to give a grain of quinine to any one without my sanction.

But may not some of these cases have been really cases of spirillar fever? As I was searching for malarial parasites, I almost invariably took films during the apyrexial stage of fever. Again my films were stained by Leishman's method, and Hodges and Ross in Uganda in their paper in the *B M*

J of 1st April, state that they find Leishman's stain not a good one for showing up spirilla.

Clinically many of the cases of "Peshawar fever" with initial vomiting and frequent relapses are exceedingly like spirillar fever.

And now Browne has found a spirillum once, no doubt it is to be found again.

The routine taking of films during the pyrexia and staining them with dilute carbol fuchsin would clear the matter up.

Yours, &c,

C N C WIMBERLEY, MAJOR, I M S

LONDON,
April 4th, 1905 }

A POSSIBLE FACTOR IN THE EPIDEMIOLOGY OF PLAGUE

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—It has been suggested that flies convey plague microbes upon their legs and bodies from the excreta of plague rats or their dead bodies to the food of human beings. It is practically certain that infection is not possible from the alimentary canal. It is possible that such flies could inoculate sores or scratches on human bodies. Another fly theory is perhaps worthy of suggestion, although at present evidence to support it is lacking while against it are obvious reasons. Flies lay eggs on certain parts of dead animals, and in two days maggots are found in the nostrils, mouth, eyes etc. These enter the body and feed on the viscera. In the case of rats the whole of the contents of thorax, abdomen and skull are rapidly removed. The maggots develop into flies and will attack sores on human bodies or in certain cases the unbroken skin, and deposit excreta on clothing and other articles. The theory suggests that plague bacilli multiply in the body of the maggot and resulting fly and are inoculated by means of proboscis or excreta into human beings. Against this theory are the following points—

(1) The time necessary for production of maggots allows putrefaction to occur and this process is inimicable to the existence of plague bacilli.

(2) So far plague bacilli have not been detected in the stomachs or bodies of maggots which have developed on plague rats nor in flies resulting from such maggots. An experiment of subjecting a rat whose skin has been scratched to the action of flies which have developed from maggots which have fed on the viscera of a rat dead from plague is not yet completed.

Yours, &c,

F N WINDSOR, CAPT, I M S, M R, B A, B S C,

Offg Chem Analyst and Bacteriologist to Govts
of U P and C P

PATHOLOGY OF HEPATIC CIRRHOSIS

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In connexion with Dr Sutherland's article on Hepatic Cirrhosis it might be interesting to note as regards its etiology that in this part of India (Bundelkhand) the disease is very rare in spite of the fact that alcohol is four times less costly and malaria four times more prevalent than elsewhere. The vast majority of inhabitants are Hindus of a conservative type. That the fibrosis is a result of Nature's attempt to put a barrier against a free passage of the excitant into the system is very plausible, but it lands us into another difficulty which cannot be easily accounted for unless we attribute to the poison or "toxin," a selective affinity for the liver cells. And that is the fact that in so called cases of "cure" by the establishment of anastomotic circulation the source of the production of toxin remaining unaffected and unaltered, they must pass on into the system by avoiding the liver route and produce the same change elsewhere particularly in the endothelium of the heart.

Then, again, the resulting ascites, as we know, is the result of backward pressure and the fluid finds its way out from the over engorged portal vein and its tributaries. This fluid, it is highly probable, contains the supposed agent of mischief, and if exhibited to animals the mucous membrane of whose stomachs has been previously injured by artificially producing gastritis by any means other than alcohol, their livers ought to show the usual changes of atrophic cirrhosis. The establishment of the fact would certainly prove Dr Sutherland's hypothesis.

Yours, &c,

LALITPORE, BUNDELKHAND,
April 29th, 1905 }

SHAM MOHAN LAL,
Asst. Surgeon.

WHAT IS HINDUSTANI FOR SCURVY?

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR—1 Under the heading *Bādi*, or *Bā'i*, are included pains in the extremities, joints and muscles, especially the lower extremity. General dropsy is also called *Bādi*.

2 Any affection of the mouth, especially of the gums, such as inflammation of the gums, spongy gums, '*monh se pani ata rat-lo*' (water coming from the mouth at night), is called *Bādi*.

3 Bruised appearances, extravasations, and fibrinous effusions into the muscles, rendering them hard and brawny, such as are met with in scurvy and purpura, are called *Bādi* or '*Bā'i*'.

4 The patient will say "*Bādi lu bimari hamko hogayhai*," i.e., I have got the disease of *Bādi* or '*hamko Bādi hogaya hai*,' i.e., I have got *Bādi*, or "*hamko Bādi na pakartiyahai*," i.e., *Bādi* has seized me.

5 These signs and symptoms come on after fatigue, privation, and exposure, or in one word exposure.

6 When *Bādi* or *Bā'i* has been, or is being complained of, by men on service, or in cantonments, I have frequently met with signs and symptoms of more or less inflammation of the lining membrane of the alimentary canal, with or without fever, with perhaps enlargement of the spleen, &c.

7 At Buxa Bhutan, where '*monh se pani ata rat-lo*' was a common sign, intense redness of all the inside of the mouth from lips to fauces and pharynx was seen. These were Poor beah sepoy.

8 At Buxa Bhutan, a Gurkha, a civil employé, one day, in the hot weather or rains, drank water on an empty stomach. He fell down immediately, insensible, vomiting and purging blood. Some weeks or months afterwards he came to hospital with ascites or dropsy, and a brawny swelling on the front of the thigh, such as is met with in scurvy.

9 Sepoys complain often of a burning sensation in the epigastrium, flatulence, and looseness and irregularity of the bowels, and sometimes nausea and vomiting, and sometimes there is more or less blood in the vomited or purged material, with mucus perhaps, diarrhoea or dysentery, or gastric or enteric catarrh in fact is complained of.

10 Such men often complain that they are suffering from *Bādi*.

11 Men in such circumstances get scurvy, as I have seen in Afghanistan, and Chitral especially, but also in Buxa Bhutan, Burma, Manipur, and the North West Frontier.

12 In the Indian troops of the Somaliland Field Force, with an average strength of 3,174, the number of cases of scurvy was equal to three times that of the whole army in India.

13 A Ward Orderly of the 1-2nd Gurkhas was with the Somaliland Field Force. He said that the men of the Indian troops, there, called their disease '*suria monh ki bimari*'.

14 They said '*monh sarigaya hai*,' i.e., the mouth is rotted.

They were Sikhs and Punjabis, and these men under such circumstances would often complain of *Bādi* or *Bā'i*.

15 The previous morning state list of diseases used to begin with fever (from '*febris*,' meaning trembling or weakness I suppose), catarrh, rheumatism, scurvy, *Bādi* or *Bā'i*.

This is the usual sequence of disease in troops.

16 They first get fever or catarrh, or influenza which is epidemic catarrh, and then after more or greater exposure they get rheumatism or scurvy.

17 Indian troops in such a condition would be certain to say that they were suffering from '*Bādi*' or '*Bā'i*' and would like to go home in order to enjoy the relaxation and recreation to be obtained there. And no doubt this is the best remedy.

18 *Bādi* means wind. It also means flatulence.

Bā'i means rheumatism, and it also means flatulence and wind.

'*Gaut*' is the Urdu for joint.

'*Gathya Bāi*' is articular rheumatism, or wind in the joints.

'*Catarrh*' is an inflammation of the mucous membrane, from two Greek words meaning *down*, and *flow*.

The French for nasal catarrh is '*rhume de cerceau*'.

The French for pneumonia is '*fluxion de poitrine*'.

Reuma is the Greek for fluxion.

Rheumatism seems to be a symbolic word, and seems to mean that the patient is suffering from signs and symptoms such as are met with in patients suffering from catarrh, i.e., rhume, or reuma, i.e., from fluxes or fluxions, i.e., from signs and symptoms brought on by exposure.

19 Scurvy seems to be another symbolic word. Scurvy is really an adjective, and one should say the scurvy disease, i.e., the disease in which scurf or scab on the skin is a sign.

20 Scorbatic seems also to be a symbolic word. It is said to come from '*scheur*,' cleft, tear, or rupture, and '*baik*' or '*baurh*,' belly, i.e., Gorman, Danish, or Dutch word.

21 *Bādi*, then, also I think may be a symbolic word. It means wind or flatulence.

Flatulence is a common sign in gastro-enteric catarrh, and other diseases of the alimentary canal.

22 People in tropical climates suffer from diseases of the digestive system, more than those in temperate climates.

23 Sepoys suffer from gastro-enteric catarrh, dysentery, &c., very commonly on service, and they very commonly complain of *Bādi*, or *Bā'i*, i.e., flatulence which is a sign or symptom in such disease.

24 Such men often also have signs and symptoms more or less marked of scurvy, and when they have scurvy they say that they have *Bādi*.

25 In such patients the skin often is very scurfy, one can write one's name on the skin of their legs, with one's nail for instance.

26 Hence '*Bādi*' is a symbolic word. It is used to signify scurvy, and it also signifies the disease which preceded or accompanied it, i.e., rhume or fluxion de ventre as the French might say, or in plain English catarrh of the alimentary canal, in which flatulence might be expected.

This may or may not be coloured with scurvy, and thereby made worse.

Scorbatic dysentery is a known bad kind of dysentery.

27 Fever may or may not accompany these catarrhs, and perhaps this is what the French mean when they speak of a *Flèvre muguense*.

28 And as malarial disease is known to exert its strength chiefly on the digestive system, exposure is still more likely to cause congestions or fluxions and fluxes in this system.

29 The signs and symptoms of purpura they also call *Bādi* or *Bā'i*.

30 In Chitral where I saw a marked outbreak of scurvy in the sepoy of the 29th P I in the winter of 1898-99, one man had a marked purpuric rash on the skin.

31 In the Century Dictionary Encyclopædia scurvy is also called purpura nautica.

32 In Chitral in 1898-99 cold weather of, there was a small but most fatal outbreak of cerebro spinal fever. In the Century Dictionary Cyclopædia cerebro spinal fever is called purpura maligna.

The men did not call cerebro spinal fever *Bādi*, but scurvy and purpura they do call *Bādi*.

33 It is strange that in the Century Encyclopædia Dictionary there should be given a sort of connection between scurvy, purpura, and cerebro spinal fever, when I remember that both scurvy and cerebro spinal fever, and a marked purpuric rash in one case of scurvy, occurred altogether in Chitral in 1898-99, cold weather.

34 The late Surgeon General Hilson, when he was Civil Surgeon of Agra in 1886, told me of another symbolic Urdu word.

35 This word is '*Nazla*.' It means nasal catarrh. But it is used to describe a person whose hair is prematurely getting grey, and whose vision is prematurely defective, and whose teeth are getting loose, and are being lost prematurely.

Such a person suffers from a kind of headache.

36 I have never met with this word, so it is perhaps more used in the civil population.

Yours, &c.,

DEHRA DOON, } F W WRIGHT, LT COL, I M S,
March 28th, 1905 } In medical charge, 12nd P W O Gurkhas

EAR DOUCHE IN THE TREATMENT OF DELIRIUM IN PLAGUE CASES

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Every one must have noted the feeling of warmth produced by merely closing the external auditory meatus in cold weather.

Inferring that circulation even in such a small area as the auditory canal must be affecting the general circulation and particularly the cerebral one, ear douche with cold water at ordinary temperature was tried in delirium—in plague cases. Unfortunately there was no opportunity to note its effects on an extensive scale in a systematic way, however in the two cases in which its trial was possible, the effect was marvellous. In both cases a few minutes' douche was enough to keep the patient quiet and to control the delirium, sleep for a few hours also followed. The douche in one case was given only once every day at night with the object of procuring sleep, and in another case it was found necessary to give the same three times a day for six days. The treatment deserves an extensive trial on account of its easy applicability, it ought to prove extremely useful in mofussil towns and villages where ice cannot be had and where people have a great aversion for continuous cold lotions and where, therefore, the results are most disappointing as one has more to rely on internal medication only. Besides its effect is much more rapid than that produced by cold lotion or ice bag.

Yours, &c.,

V D MERCHANT, L M & S,

Asst Surgeon in charge, Malegaum Dispensary

THE ANTIQUITY OF HINDU VACCINATION

To the Editor of THE INDIAN MEDICAL GAZETTE

SIR,—Notice having been taken in several Indian news papers of the article which appeared in the *British Medical Journal* of the 15th of April, questioning the validity of my statements on the above subject and more especially asserting, in my opinion, most rashly and erroneously, that the advance of vaccination in the Madras Presidency was in by gone days supported by falsified Sanscrit writings, I trust you will oblige me by inserting a copy of my reply to that Journal's strictures. I take the liberty of troubling you in this matter, as it is obvious that what I judge to be erroneous impressions would be allowed to spread beyond possibility of recall, if the very great time which lapses between receipt of a statement in this country and the acknowledgment of its contradiction by a Journal published in Great Britain were not taken due account of. I would take this opportunity of stating that I should be greatly obliged by any Sanscrit authority aiding me in tracing to its source the disputed quotation. It seems to me more than possible that even if the real author was not Dhanwantari, it is nevertheless derived from an ancient author.

MADRAS, }
11th May 1905 }

Yours, &c,
W G KING,
LT COL, I M S

The following letter has been addressed —

To the Editor of "BRITISH MEDICAL JOURNAL"

SIR,—In your issue of the 15th April, you refer to the above subject as discussed by His Excellency Lord Ampthill in his address at the opening of the King Institute, Madras. During his tenure of office, he has, as is well known, taken every opportunity of encouraging the advance of preventive medicine, and has also exhibited interest in the historical bearing of the subject in this country, in connection with ancient Hindu writings. In response to a query on the latter aspect two years back, I furnished him with the paper to which he referred. As Lord Ampthill's statements, in this particular, were made on the authority of this document it rests solely with me to deal with the matter.

The paper in question was published in the *Madras Mail*, in 1899, in response to a request for information to me personally in its columns by the late Surgeon General Sir Charles Gordon. It opened by referring to the oft-quoted passage from the *Madras Courier* of 1819, and stated distinctly that it had "at intervals been circulated to the lay and medical press." I then proceeded to say that for many years I had attempted, with the aid of Sanscrit scholars, verification of its origin from Dhanwantari and, after alluding to the difficulty attending such researches, explained that "the nearest approach" to settling the question was obtained when hunting for Sanscrit references for plague, by the quotation being found in a Sanscrit work entitled "Ayurveda Vijnana." This is a modern compilation of extracts from various authors. As a fact, it was I who though no Sanscrit scholar, was able to arrest attention to the passage whilst the book was being read aloud to me as I had heard it so often quoted, and it was to this little incident Lord Ampthill had the kindness to allude. Since that period it has also been found for me in the "Sadbakalpadruma," which is also a modern compilation written by Rajah Sir Radakant Deb Bahadur. This author was held in the highest respect by the best Sanscrit scholars including Max Muller—a fact which should weigh in favour of the genuine character of the quotation. The work was completed, according to the author, in the thirtieth year of his age or six years before the appearance of the "poem" quotation. It is necessary to allude to these facts in your article erroneously assumed that I had a claim to precedence in respect to the *Madras Courier* of 1819, in first drawing attention to the subject.

Your main object is, however, to throw doubt upon the validity of the quotation. Unfortunately, I am not in a position to consult Baron's work quoted as your authority, and I am placed in some difficulty by your not positively affirming that the false "poem" actually contained the particular verse ascribed to Dhanwantari. I shall be very much surprised if this can really be done by you. But, even if the subject be treated in the general manner you have done, I think it reasonable to believe that Baron must have misunderstood Sir John Malcolm. He must have muddled the whole subject. Far from Ellis being the criminal, he was eminently an interpolation detective. In the fourteenth volume of the *Transactions of the Asiatic Journal*, there will be found exposed by Ellis, in an essay that exhibited the depth of his learning as a Sanscrit scholar as well as his careful and impartial spirit, a gross fraud by Jesuits who had, for the purpose of advancing

their religion, resorted to this means. The book which he thus criticised was entitled "L'Ezour Vedam," and was published in Paris in 1778. If this date be taken into consideration, it is clear vaccination need not have been referred to, seeing that Jenner's scientific confirmation of empirically observed facts was not made till 1798, and vaccination was not introduced into Madras by Lord Clive (Earl Powis) until 1802. Failing therefore, your being able to prove the quotation actually formed part of the "poem" you ascribe to Ellis, and you are able to state where the rest of the document is to be found, there is no reason to regard him as guilty of the grave charge made against him, or that you have adduced anything to disprove the ancient character of the quotation, rightly or wrongly, attributed to Dhanwantari. I of course do not join issue with you as to your second instance of an interpolation, as this was not propounded by me.

As the Vaccination Department of this Presidency is a branch of my office, I have every opportunity of consulting its records, and I may state that, although it is evident many thousands of pamphlets encouraging vaccination were issued in former years, I can find no attempt to impress the people with the so called "poem" of Ellis and, in my opinion, such a base act would no more have secured official approval in India in the past than in the present, nor, in the Sanscrit libraries available in this Presidency, is there any trace of such a record.

MADRAS, }
11th May 1905 }

(Sd) W G KING,
LIEUT COL, I M S,
Sanitary Commissioner for Madras

LENS COUCHING

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—With reference to Major F. P. Maynard's letter in your issue for May on the subject of lens couching, I may say that he is not correct in thinking that my paper was based on his only. I included all the modern advocates and quasi advocates of lens couching. Major Maynard's terms "allowable if not advisable under certain circumstances," and his statement that he does not agree with all Mr. H. Power's postulates is rather too vague a position to be grappled with, and I hope he will kindly state definitely the cases he considers "allowable," "justifiable," and "advisable," for lens couching in preference to lens extraction.

JULLUNDER, }
16th May 1905 }

Yours, &c,
HENRY SMITH, M D,
MAJOR, I M S

Service Notes.

INCREASE IN EMOLUMENTS OF INDIAN MEDICAL SERVICE OFFICERS IN CIVIL EMPLOYMENT—By the orders contained in the Military Department Notification No 1047, dated the 23rd October 1903, the pay of officers of the Indian Medical Service in military employ was raised. In connection with this decision the Government of India have carefully examined, in communication with Local Governments the question of the adequacy of the rates of pay of officers of that service in civil employment. The Secretary of State's orders on their proposals have now been received, and the Governor General in Council is pleased to notify the conclusion arrived at for the information of the service.

2 The scale of pay attached to the appointments, the emoluments of which are or will in future be determined by the military pay of the officers holding them, has been revised in the manner shown in schedule A. The consolidated pay of the appointments shown in schedule B has also been revised. Neither schedule includes appointments in the Jail Department, regarding which orders will be issued hereafter. In view of the unavoidable delay that has occurred in dealing with this complicated question, the Secretary of State has agreed, as a special concession, that the revised rates of pay shall take effect from the 1st April 1904. In any case where the changes now sanctioned may result in reducing the emoluments of an appointment they will not be introduced until it has been vacated by the present incumbent.

3 It has further been decided, with the approval of the Secretary of State, that the allowance of Rs 200 per mensem granted under the General Order No 370 of 1867 for the charge of certain minor professorships shall, in the case of future incumbents, be treated as a local allowance. The allowances of officers hereafter appointed to officiate in such appointments will be regulated by the new scale.

SCHEDULE A

MONTHLY SALARIES AND ALLOWANCES.

MONTHLY SALARIES AND ALLOWANCES.												
Appointment	Government or Province	Lieut Col (specialty selected for increased pay)	Lieut Col after 2½ years service.	Lieut Col + 100†	Lieut Col + 150†	Major after 3 years' service.	Major + 100†	Captain after 10 years service	Captain after 7 years' service	Captain after 5 years' service	Captain	Lieutenant
Civil or Agency Surgeons, 1st Class	All provinces Bombay	1,450	1,350	1,550	1,650	1,800	1,900	2,000	2,100	2,200	2,300	2,400
Presidency Surgeons, 2nd and 3rd Districts												
Civil or Agency Surgeons, 2nd Class.	{ Madras Bombay Bengal Punjab }	1,350	1,250	1,450	1,550	1,700	1,800	1,900	2,000	2,100	2,200	2,300
Professional appointments at the towns of Calcutta, Bombay, Madras and Lahore												
Principal, Grant Medical College	Bombay	1,650	1,550	1,750	1,850	2,000	2,100	2,200	2,300	2,400	2,500	2,600
Principal, Lahore Medical College.	Punjab	1,800	1,700	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700
Deputy Sanitary Commissioners	{ Madras Bombay Bengal United Provinces Punjab Burma }	1,400* + 100†	1,300* + 100†	1,500* + 100†	1,600* + 100†	1,700* + 100†	1,800* + 100†	1,900* + 100†	2,000* + 100†	2,100* + 100†	2,200* + 100†	2,300* + 100†
Provisionary Chemical Examiners	{ Bombay Bengal United Provinces Punjab Burma Madras }	1,500	1,400	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400
Bacteriological appointments. Superintendent, King Institute	{ Bombay Bengal United Provinces Punjab Burma Madras }	1,000† + 600†	900† + 600†	1,100† + 600†	1,200† + 600†	1,300† + 600†	1,400† + 600†	1,500† + 600†	1,600† + 600†	1,700† + 600†	1,800† + 600†	1,900† + 600†
Superintendents, Central Lunatic Asylums	{ Madras Bombay Bengal United Provinces Punjab Burma }	1,000† + 550†	900† + 550†	1,100† + 550†	1,200† + 550†	1,300† + 550†	1,400† + 550†	1,500† + 550†	1,600† + 550†	1,700† + 550†	1,800† + 550†	1,900† + 550†

SCHEDULE A—(Continued)

Appointment	Government or Province	MONTHLY SALARIES AND ALLOWANCES										Lieut Col (specialty selected for increased pay)	Lieut Col after 25 years' service	Lieut Col	Major after 3 years' service	Major	Captain after 10 years' service	Captain after 7 years' service	Captain after 5 years' service	Captain	Lieutenant	* Consolidated military pay + Staff allowance These appointments are not ordinarily held by officers below the rank of Major \$ Local allowance + Military grade pay + Police allowance	
Personal Assistant to Surgeon-General Surgeon, Gokaldas Tejpal Hospital Physician, St George's Hospital	Madras Bombay	1,650	1,550	1,500	1,150	800* + 100† 900	750* + 100† 800	650* + 100† 750	600* + 100† 700	550* + 100† 650	500* + 100† 600	* Consolidated military pay + Staff allowance These appointments are not ordinarily held by officers below the rank of Major \$ Local allowance + Military grade pay + Police allowance											
Port Health Officer	Bombay	1,450 + 500\$ 1,050	1,350 + 500\$ 1,850	1,300 + 500\$ 1,800	950 + 500\$ 1,450	850 + 400\$ 1,250																	
Port Surgeon, Aden	Bombay	1,450 + 150\$ 1,600	1,350 + 150\$ 1,500	1,300 + 150\$ 1,450	950 + 150\$ 1,100	850 + 150\$ 1,000																	
Resident Surgeons, Medical College, Calcutta. Port Health Officer, Calcutta	Bengal	1,450 + 200† 1,650	1,350 + 200† 1,550	1,300 + 200† 1,500	950 + 200† 1,150	850 + 200† 1,050	750 + 200† 950	700 + 200† 900	600* + 200† 850	650 + 200† 800	550 + 200† 750												
	Bengal																						
Resident Medical Officer, General Hospital, Rangoon	Burma	1,000† + 200\$ + 150** 1,350	900† + 200\$ + 150** 1,250	900† + 150** 1,250	750† + 200\$ + 150** 1,100	650† + 200\$ + 150** 1,000	550† + 200\$ + 150** 900	500† + 200\$ + 150** 850	450† + 200\$ + 150** 800	400† + 200\$ + 150** 750	350† + 200\$ + 150** 700												
Secretary to the Director-General, Indian Medical Service	Government of India.	1,000† + 500† 1,600	900† + 500† 1,500	900† + 500† 1,500	750† + 500† 1,350	650† + 500† 1,250	550† + 500† 1,150	500† + 500† 1,100	450† + 500† 1,050	400† + 500† 1,000	350† + 500† 950												
Statistical Officer to the Government of India, Sanitary and Medical Departments	Government of India.	1,000† + 500† 1,500	900† + 500† 1,400	900† + 500† 1,400	750† + 500† 1,250	650† + 500† 1,150	550† + 500† 1,050	500† + 500† 1,000	450† + 500† 950	400† + 500† 900	350† + 500† 850												

SCHEDULE B

Appointment	Government or Province	Monthly salaries
Inspector General of Civil Hospitals.	Bengal	Rs 2,500
	Punjab	2,250
	Burma	
Sanitary Commissioners	Madras	1,500—60—1,800
	Bombay	
	Bengal	
	United Provinces	
First Resident Surgeon, General Hospital, Calcutta.	Bengal	1,000
		800
Second Resident Surgeon, General Hospital, Calcutta		

CAPTAIN R. BRYSON, I.M.S., has been granted nine months' leave to Europe (M.C.)

CAPTAIN A. CHALMERS' leave expired 13th March 1905

CAPTAIN S. BOSE, I.M.S., got three months' privilege leave up to 11th May 1905

THE author of the very valuable catalogue of the Pathological Museum of the Bombay Medical College (extracts from which were quoted by Dr. Nicolas Senn in the selections we gave from this 'Travel Notes' in our March issue) is not Captain Gordon as was there printed, but Captain E. F. Gordon Tucker, I.M.S.

CAPTAIN O. H. S. LINCOLN, I.M.S., has gone on leave

LIEUTENANT COLONEL W. H. QUIRKE, F.R.C.S., I.M.S., has been allowed six weeks' extension of furlough

LIEUTENANT G. D. FRANKLIN, I.M.S., and Lieutenant R. Kellsall, I.M.S., have passed the Lower Standard in Urdu

LIEUTENANT COLONEL J. A. CUNNINGHAM, I.M.S., Civil Surgeon, Punjab, has gone on two years' combined leave

THE following changes have taken place in the Calcutta Medical College —

Lieutenant-Colonel Lukis, M.D., F.R.C.S., I.M.S., is appointed Principal of the College, Major F. J. Drury, M.B., I.M.S., has gone on furlough, Lieutenant-Colonel R. H. Charles, I.M.S., is appointed Professor of Surgery, and Major D. M. Moir, I.M.S., is appointed Professor of Anatomy. Major R. Bird, C.I.E., I.M.S., has gone home on long leave

THE undermentioned officers, who were appointed Lieutenants on probation for the Indian Medical Service, having completed a course of instruction at the Medical Staff College, and being reported qualified, have been finally admitted to the service. The Commands to which they have been posted, and the date of their commissions, are shown below —

1st September 1904

Horace Sidney Matson (Eastern Command)
Donald Steel (Eastern Command)
Francis Hugh Stewart (Northern Command)
Hampton Atkinson Dougan (Northern Command)
Alexander Cameron (Northern Command)
Alfred Henry Proctor (Northern Command)
Robert Tait Wells (Northern Command)
Ian Macpherson Macrae (Secunderabad Division)
Charles Cecil Connock Shaw (Secunderabad Division)
Roderick Dear MacGregor (Secunderabad Division)
James Wilson Herbert Babington (Secunderabad Division)

Alexander Spalding Mackie Peebles (Western Command)
Francis Broughton Shettle (Western Command)

THE undermentioned Lieutenant of the Indian Medical Service, posted to the Command noted against his name, reported his arrival at Bombay on the date specified —

GEORGE FRANCIS INNES HARKNESS (Western Command), — 16th April 1904

CAPTAIN W. H. KENRICK, I.M.S., is placed on special duty at Pachmarhi, C.P., from 1st April till 30th June, as Civil Surgeon

ASSISTANT SURGEON B. B. GUPTA is appointed to act as Civil Surgeon of Hoshangabad, C.P.

LIEUTENANT COLONEL A. SILCOCK, I.M.S., acts as Civil Surgeon, 1st class, *vice* Lieutenant-Colonel Quayle, on leave

CAPTAIN G. E. STEWART, I.M.S., 127th Baluchis, is granted eight months' combined leave Pension service, 7th ear, commenced 27th July 1904

CAPTAIN W. H. CAZALY, I.M.S., is granted six months' extension of leave on medical certificate

HONORARY CAPTAIN G. McCall, I.S.M.D., Civil Surgeon, Kheri, U.P., is granted three months' privilege leave

HONORARY LIEUTENANT G. HYNES, I.S.M.D., is posted as Civil Surgeon to Kheri

LIEUTENANT COLONEL K. A. DALAL, I.M.S., is granted 2½ months' privilege leave

LIEUTENANT COLONEL T. H. SWRENY, I.M.S., Civil Surgeon of Benares is granted six months' special leave from 30th March 1905

MAJOR J. K. CLOSE, I.M.S., is appointed to act as Civil Surgeon of Benares.

MAJOR J. G. HULBERT, I.M.S., is appointed Civil Surgeon of Shabjahanpuri

MILITARY ASSISTANT SURGEON HOGAN is appointed Civil Surgeon of Banda.

ANOTHER I.M.S. officer has been elected to the high honour of Fellowship of the Royal Society, *viz*, Lieutenant Colonel D. Prain, M.B. (Aber), Director of the Botanic Survey of India

COLONEL S. H. BROWNE, C.I.E., I.M.S., has returned from short leave to Egypt and resumed his appointment as Inspector General of Civil Hospitals in Bengal

WE understand that the rumour that Colonel T. H. Hendley, C.I.E., I.M.S., was to receive pay for the appointment on the Board of the Church Missionary Society is not correct, though it was quoted to us on the authority of a missionary newspaper. Colonel Hendley has joined the Honorary Committee, and is characteristically busying himself in such work, and in the Indian Exhibition in the East end of London

ON his return from leave Major W. B. Lane, I.M.S., Superintendent of the Jubbulpore Central Jail, is appointed Inspector General of Prisons in the Central Provinces

LIEUTENANT COLONEL H. E. BANATVALA, I.M.S., is posted as Civil Surgeon, Nimar, C.P.

LIEUTENANT COLONEL K. R. KIRTIKAR, M.R.C.S., &c, I.M.S., is appointed a Member of the Examination Committee in Marathi

LIEUTENANT COLONEL W. A. CORKERY, I.M.S., is granted nine months' combined leave

CAPTAIN H. BENNETT, M.B., F.R.C.S., I.M.S., acts as Civil Surgeon of Ratnagiri, *vice* Lieutenant-Colonel Corkery on leave

ASSISTANT SURGEON B. H. NANAVATI, F.R.C.S. (Ed.), acts as Civil Surgeon of Surat

THE following Resolution by the Government of India, Finance and Commerce Department, No 1116 P, dated Calcutta the 22nd February 1905, is published for information "His Excellency the Governor General in Council is pleased to direct in supersession of all previous orders on the subject, that an officer who takes casual leave when on tour shall not be entitled to draw daily allowance during such leave" This applies both to Civil and to Military employ

CAPTAIN H J WALTON, I M S, F R C S, Officiating Civil Surgeon, Jhansi, went on one year's combined leave from 30th March

MAJOR H A SMITH, I M S, Civil Surgeon, Rae Bareilly, got one year's combined leave (*m c*) from 25th April

CAPTAIN R M CARTER, I M S, held temporarily medical charge of Jhansi in addition to his military duties *vice* Captain Walton

LIEUTENANT F P CONNOR, F R C S, I M S, is posted to the officiating medical charge of the 16th Rajputs

LIEUTENANT C H BRODRIBB, M B, I M S, is posted to the officiating medical charge of the 5th Cavalry

CAPTAIN A G MCKENDRICK, M B, is posted to the officiating medical charge of the 18th Infantry

CAPTAIN W M ANDERSON, I M S, is posted to the officiating medical charge of the 24th Punjabis

MAJOR G T MOULD, I M S, 1st Lancers, is granted leave out of India for eight months, pending retirement Pension service, 17th year, commenced 3rd June 1934

LIEUTENANT S B SCOTT, I M S, is granted five months' leave on private affairs, including two months' privilege leave

CAPTAIN A COCHRANE, F R C S, I M S, is posted as Superintendent, Lunatic Asylum, Agra.

MAJOR L J PISANI, F R C S, I M S, holds additional medical charge of Bijnor *vice* Major Marks transferred

Dr E J SIMPSON is transferred from Jalaun to Sultanpur as Civil Surgeon

CAPTAIN C G BIRDWOOD, I M S, is again posted to Agra as Civil Surgeon

CAPTAIN T HUNTER, I M S, is transferred from Farrukhabad to Rae Bareilly as Civil Surgeon

THE services of Captain W H ORI, I M S, are placed permanently at the disposal of the Government of the United Provinces

CAPTAIN J DAVISON, I M S, holds medical charge of the Civil Station of Buxa, Alipore Duars, in addition to his military duties

CAPTAIN N S WELLS, I M S, got six months' combined leave with effect from 12th October 1904 This cancels Notification dated 28th February 1905

ON the appointment of Major Moir as Professor of Anatomy in the Medical College, Calcutta, Captain Gwyther, I M S, went to Chapra as Civil Surgeon

CAPTAIN T H DELANY, I M S, has gone on furlough

LIEUTENANT COLONEL PAT A WEIR, I M S, the A M O of the N-W Frontier Province, has been granted six months' leave, and Lieutenant-Colonel H N V Harrington, I M S, acts as A M O

LIEUTENANT COLONEL G W P DENNY, I M S, Civil Surgeon of Peshawar, has taken six months' combined leave, and Captain F W Sumner, I M S, acts for him

MAJOR A W F BUIST, I M S, acts as Civil Surgeon of Multan, *vice* Major D M Davidson, I M S

MAJOR H M MORRIS, I M S, has been appointed Civil Surgeon of Jhelum

CAPTAIN M CORRY, I M S, has been appointed Civil Surgeon of Murree

CAPTAIN G McIVER SMITH, I M S, has been placed on special duty in the Kangra Valley in connection with the damages of the earthquake

MAJOR A COLEMAN, I M S, has gone to Sialkot as Civil Surgeon

MAJOR S BROWNING SMITH, I M S, has been appointed Chief Plague Officer, Punjab, *vice* Major Wilkinson, I M S, who has gone on well earned furlough

LIEUTENANT F POWELL CONNOR, I M S, Medical Officer, 16th Rajputs, held civil medical charge of the Manipur State, with effect from 10th March 1905

ON the return of the Kabul Mission the services of Captain W B Turnbull, I M S, are placed at the disposal of the Government of the United Provinces

LIEUTENANT A F PREDHAM, I M S, Lieutenant T O Rutherford, I M S, and Lieutenant R Kelsall, I M S, have gone to Burma on plague duty

LIEUTENANT COLONEL A J STUBBS, I M S, Superintendent of the Maternity Hospital, Madras, is permitted to retire

MAJOR H FOOKS, I M S, is granted six months' leave out of India

LIEUTENANT E C BARNES, I M S, is granted nine months' leave out of India

CAPTAIN H KIRKPATRICK, I M S, is granted six months' combined leave

CAPTAIN A CHALVERS, I M S, acts as Superintendent of the Lunatic Asylum, Madras, during the absence of Captain R Boyson, I M S, on leave

CAPTAIN A GWYHER, I M S, has gone to Chapra as Civil Surgeon, and Captain Thornley, I M S, from Rangpore to Durbhunga

CAPTAIN E O THURSTON, F R C S, I M S, has succeeded Major B Oldham, I M S, as Civil Surgeon of Chittagong

CAPTAIN R L HAGGER, I M S, is appointed to the officiating medical charge of the 127th Baluch Light Infantry, *vice* Captain G E Stewart, I M S, on furlough

CAPTAIN R M CARTER, I M S, has been permitted to return to duty

LIEUTENANT COLONEL F O REEVES, I M S, whose nine months' leave was due to expire on 8th June 1905, has applied for three months' extension

ON the departure on furlough of Major C Duer, F R C S, I M S, Junior Civil Surgeon, Rangoon, Major J Penny, I M S, is appointed to officiate

LIEUTENANT A W GREIG, I M S, is appointed to act as Superintendent of the Central Jail at Mandalay

LIEUTENANT EMBLIE SMITH, I M S, is appointed to the charge of the wing of 13th Rajputs at Buxa, Duars

CAPTAIN J DAVIDSON, I M S, is appointed to the medical charge of the 13th Rajputs at Ranchi

THE services of Captain W M Pearson, I M S, and of Captain Campbell Dykes, I M S, are placed temporarily at the disposal of the Government of the United Provinces

LIEUTENANT COLONEL E OLETIN, I M S, has been granted ten months' leave on medical certificate

CAPTAIN G Y C HUNTER, I M S, is granted eight months' combined leave

MAJOR J B BUCHANAN, R A M C, was granted eight, not six, months' leave out of India.

ASSISTANT SURGEON HOMEWELL LYNOLPH acted as Civil Surgeon, Goalpara

MAJOR E C HARE, I M S, Civil Surgeon, Shillong, has passed the examination in the Khasi language and received the authorised reward of Rs 1,000

CAPTAIN W D RITCHIE is appointed to officiate as Civil Surgeon of Dhubri

UNDER the provisions of Articles 260, 316 and 233 of the Civil Service Regulations privilege leave for three months and leave to Europe on urgent private affairs for three months in continuation thereof is granted to Captain L E Gilbert, M B, I M S, Officiating Health Officer, Rangoon Municipality with effect from the date on which he may avail himself of the privilege leave

LIEUTENANT R KELSALL, I M S, on plague duty at Rangoon, is appointed to officiate as Health Officer, Rangoon Municipality, in addition to his own duties, in place of Captain L E Gilbert, M B, I M S, proceeding on leave

THE following postings and transfers are ordered in the Medical Department, Burma —

Captain F A L Hammond, I M S, to officiate as Resident Medical Officer General Hospital, Rangoon, in place of Captain H A Williams, M B, I M S, transferred

On relief by Captain Hammond, Captain H A Williams, M B, I M S, to officiate as Deputy Sanitary Commissioner

COLONEL J S WILKINS, I M S, P M O, Aden Brigade, is granted six months and seventeen days' combined leave

MAJOR J LLOYD JONES, I M S, Deputy Assay Master, Calcutta Mint, has gone on furlough, on recovery from a serious illness

CAPTAIN W M ANDERSON I M S, is posted as Civil Surgeon of Wana

MAJOR F J DRURY, Major H J Dyson, Major F A Rogers, D S O, and Major E R W S Carroll have been promoted Lieutenant-Colonels from 1st April 1905

COLONEL C H JOUBERT, F R C S, I M S, has retired from the service. He was born in March 1846, entered the service in March 1872, became Surgeon 1884, attained brigade rank in October 1896. He was for many years a Civil Surgeon in Bengal, he succeeded the late Surgeon General R Harvey as Professor of Midwifery in the Calcutta Medical College, where he enjoyed a large practice. On promotion he became P M O and afterwards Inspector General of Civil Hospitals, United Provinces. He has been succeeded by Colonel R. D Murray, I M S

MAJOR F WYVILLE THOMSON, I M S, has been granted four and a half months' extension of leave

ON transfer from Sialkot Lieutenant-Colonel H Hendley, I M S, is appointed Civil Surgeon of Amritsar, *vice* Major A W T Baist, I M S

ON return from leave Lieutenant-Colonel D St G Grant, I M S, resumes his appointment as Chemical Examiner to the Punjab, and the services of Captain A Miller, I M S, are replaced at the disposal of the Home Department

LIEUTENANT COLONEL G T THOMAS, I M S, has been granted an extension of leave for three months

LIEUTENANT COLONEL A V ANDERSON, I M S, is granted six months' extension of furlough

DR R HAY PALIPUKA is transferred from Jalpaiguri to Rangpur

LIEUTENANT COLONEL F C REEVES, I M S, is permitted to return to duty

SURGEON GENERAL McCONAGHY, I M S, of Bombay, has been obliged to go home owing to illness

WE note that in the April number of the Indian Army List the dates of birth are given of all Lieutenant-Colonels, I M S

By a mistake in the head line all Captains I M S, are included in the Bombay Medical Service in the April Army List.

CAPTAIN H BENNETT, I M S, took over charge of the Jail at Ratnagiri on 1st Apr 1905

MILITARY ASSISTANT SURGEON D O'C MURPHY was granted two months' privilege leave from 7th May 1905

LIEUTENANT J H BURGESS, M B, I M S, is posted to the officiating medical charge of the 24th Punjabis

CAPTAIN M MACKELNIE, M B, and Captain W M Anderson, I M S, are attached to the 2/9th Goorkha Rifles, and detailed for recruiting duty at Gorakhpur

WE regret to learn that Captain H B Meakin, I M S, who only a few months ago returned to India, has been again obliged to go on leave for six months. Pension Service, seventh year, commenced 27th July 1904

SENIOR ASSISTANT SURGEON and Honorary Captain E W Bates has been granted eight months' leave (*m c*)

LIEUTENANT COLONEL K NARIMAN, I M S, Civil Surgeon of Nasik, died suddenly of heart failure and was buried according to Parsee rites in Bombay

CAPTAIN LANG, I M S, Superintendent of the Central Prison, Yerwada, Poona, died suddenly of cerebral hæmorrhage

SENIOR ASSISTANT SURGEONS W HEATHCOCK and F Bradley are promoted to be Honorary Captains, I S M D

HONORARY LIEUTENANT W H ROBINSON is promoted to Honorary rank of Captain, I S M D

SENIOR ASSISTANT SURGEON M E MANGAVIN, I S M D, is promoted to honorary rank of Lieutenant

ASSISTANT SURGEON P VICTOR is promoted to rank of Honorary Lieutenant.

LIEUTENANT COLONEL C O VAID, I M S, is permitted to retire from 18th May 1905

LIEUTENANT COLONEL MUKERJEE, I M S, is permitted to retire

CAPTAIN W B TURNBULL, I M S, is posted to Gonda, U P, as Civil Surgeon

CAPTAIN W M PEARSON, M B, I M S, is posted to Bijnor as Civil Surgeon

CAPTAIN CAMPBELL DIXES, I M S, is posted to Farukabad as Civil Surgeon

CAPTAIN R F BAIRD, I M S, is granted eight months' leave, including 90 days' special Tibet leave

MAJOR E G R WHITCOMBE, I M S, was appointed Civil Surgeon of Jacobabad in addition to his other duties from 27th March

THE following order is published in Indian Army Orders, dated 1st May 1905 —

PAY AND ALLOWANCES—FURLOUGH AND LEAVE—OFFICERS—The Right Hon'ble the Secretary of State for India has brought to notice that several cases have recently occurred of great delay in the receipt from India of last-pay certificates for officers arriving in England on leave, thus causing considerable inconvenience, and in many cases necessitating the issue of temporary advances of pay.

This delay, not infrequently, is due to officers not giving the necessary intimation to the pay authorities, but to obviate any further difficulties, the attention of all concerned is drawn to the regulations on the subject, which must be strictly observed.

In the case of officers whose combined leave is converted into leave on private affairs or medical certificate, revised

last-pay certificates must be prepared and sent home immediately on receipt of the India Office weekly list notifying the conversion of the leave

CAPTAIN G KING, I M S, has gone to Jessore as Civil Surgeon

CAPTAIN W COPPINCER, I M S, has gone to Julpaiguri as Civil Surgeon

LIEUTENANT M BAKET, I M S took over charge of the duties of the Medical Officer, Kongtung, Southern Shan States, on 14th March

THE services of Captain G O L Korans, I M S, are placed temporarily at the disposal of Assam

CAPTAIN A G SARGENT, I M S, has joined the Bombay Jail Department

CAPTAIN T S B WILLIAMS, I M S, is posted as Consular Surgeon, for Arabistan and Kermanshah

CAPTAIN P P KILKELLY, I M S, took charge of the current duties of Political Agent, Bikanir, temporarily on 10th April

CONFIDENTIAL REPORTS—Annual Confidential Reports, Indian Army Form I 1120, on officers of the Indian Medical Service are not required in duplicate and should in future be prepared in original only

DRESS—OFFICERS—The following rules (which supersede those published on the subject in Command Order No 305 of 1904) are issued for the guidance of officers as regards wearing uniform at Simla, and obtaining interviews with the Commander in Chief in India—

I—His Excellency the Viceroy

(a) *Review order—dismounted* will be worn on State occasions, at levées and balls, and when otherwise specially ordered, or when so noted on the invitation card. Helmets need not be taken to balls, but must be taken to levées

(b) *Mess dress* will be worn on all other occasions of evening entertainments or dinners at Government House, and elsewhere when officers are specially invited to meet His Excellency the Viceroy

(c) *Drill order (dismounted, serge)* will be worn by officers when an interview may be accorded to them by His Excellency the Viceroy

II—His Honour the Lieutenant Governor of the Punjab

(d) *Mess dress* will be worn by officers invited to dinner or to evening entertainments, unless "plain clothes" is noted on the invitation card

III—The Commander in Chief in India

(e) *Mess dress* will be worn by officers invited to dinner or to evening entertainments, unless "plain clothes" is noted on the invitation card

(f) *Mess dress* will also be worn when officers are specially invited to meet His Excellency

(g) *Drill order (dismounted, serge)* will be worn by officers when visiting the Commander in Chief on duty, or when private interviews have been granted them on matters of business

IV Masonic Ball

Officers who are masons, wearing masonic decorations, may wear plain clothes. All other officers will appear in mess dress

V—Plain Clothes

May be worn when off duty on occasions other than those mentioned above

VI—Interview with the Commander-in-Chief

Any officer desiring an interview on public or personal business will inform the Military Secretary to the Commander in Chief by letter of his wish to see His Excellency, stating at the same time the object of the interview he solicits

LIEUTENANT COLONEL H C BANNERJEE, I M S, Civil Surgeon of Nadia, has been seriously ill.

LIEUTENANT J H MURRAY, I M S, is appointed to be Health Officer of Simla

THE tenure of Colonel R Macrae's appointment in Burma will date from 1st March 1905

LIEUTENANT-COLONEL U N MUKERJI, M B, I M S, is permitted to retire from 17th February 1905

HONORARY LIEUTENANT R COLLINS, I S M D, is permitted to retire from 26th January 1905

DR. A M LEAKE, V C, F R C S, is appointed to be Surgeon Lieutenant, Bengal-Nagpur V Rifles

MAJOR D M DAVIDSON, M B, I M S, is again appointed Civil Surgeon of Delhi, *vice* Lieutenant-Colonel J A Cunningham, I M S, gone on leave.

COLONEL J P GREANY, I M S, has returned to duty from leave

CAPTAIN S HUNT, I M S, has returned to duty from leave

CAPTAIN W M HOUSTON, I M S, 123rd Ostram's Rifles, has been granted combined leave for eight months

THE following officers, I M S, have been placed on special plague duty in Rangoon—Lieutenant F R C Talbot, I M S, Lieutenant R Kelsall, I M S, Lieutenant T C Rutherford, I M S, and Lieutenant A T Prudham, I M S

Notice

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis if requested

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co Calcutta

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs Thacker Spink & Co, Calcutta

Annual Subscriptions to the *Indian Medical Gazette*, Rs 12, including postage, in India Rs 14, including postage abroad

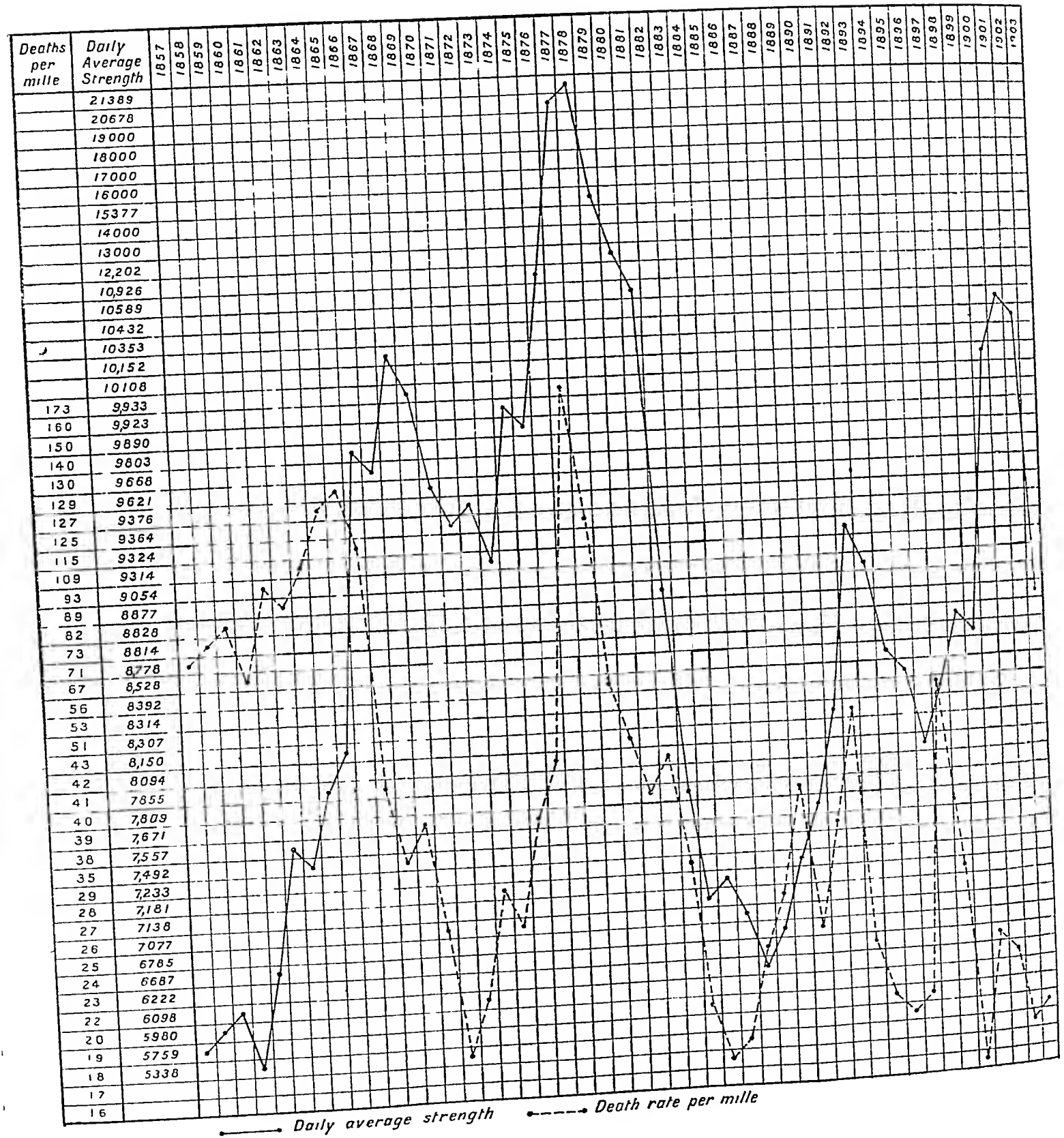
BOOKS, REPORTS, &c, RECEIVED—

Transactions, South Indian Branch, B M A
Eye, Ear and Throat Nursing Davis and Douglas (The F A Davis Co)
Practical Pediatrics Sheffield F A Davis Co
Plague M Herzog The Manila Laboratory
Glanders Wherry The Manila Laboratory
Treatise on Plague W J Simpson, Cambridge University Press
Report on Anti-malarial Operations at Klang
Agricultural Ledgers
Taylor's Principles and Practice of Medical Jurisprudence (J & A Churchill)

LETTERS, COMMUNICATIONS, &c, RECEIVED FROM—

Captain F W Sumner, I M S, Kohat Capt Robertson Milne, I M S, Lahore, Major F P Maynard, I M S, Darjeeling, Major C H Wimbler, I M S, London, Capt Lee Abbott, I M S, Jhansi Capt F N Windsor, I M S, Agra Mr Hankin London Dr W J Simpson London, Major R H Elliot, I M S, Madras Major Henry Smith, I M S, Jullundur Lt Col Lukis, I M S, Calcutta Major J R Roberts, I M S, Indore, Major C Earnscliffe, I M S, Vellore Major E Jennings, I M S, Breilly Major W Jennings, I M S, Bombay Capt S P James, I M S, Simla Lt Col W King, I M S, Madras Capt E A R Newman, I M S, Hazaribagh, Lt Norman White, I M S, Simla, Major Maddox, I M S, Ranchi Lt Col J Smyth, I M S, Madras Lt C Brodribb, I M S, Meerut, Major L Pisani Noradabad, Lt Col Wright, I M S, Dehra Dun

Chart A.



Original Articles.

DYSENTERY IN THE PRISONS OF THE
MADRAS PRESIDENCY

BY O F FEARNSIDE, M.B.,

MAJOR, I.M.S.,

Medical Superintendent, Central Prison, Vellore

THE object of this paper is to review the medical history of the prisons in the Madras Presidency since the year 1867, more particularly in reference to the rôle that dysentery has played in the vital statistics. The administration reports of the jails of the presidency furnish many examples of the proverbial sayings that statistics lie and doctors differ, faulty diagnosis putting the statistics out of joint, and outbreaks of the same disease, *eg*, dysentery in the same jail being ascribed to different causes by different medical men.

In civil life the physician seldom has the opportunity of verifying his diagnosis in fatal cases by a *post mortem* examination, whereas the prison doctor is always able to do so. Hence at the autopsy of a prisoner the physician may be somewhat upset by finding something he did not expect, and hence there has been, in the past, a reluctance to change the diagnosis so as to confirm with the *post mortem* lesions, and on this lies the basis of statistical errors in the past.

Modern research has done much during the past decade to improve the diagnosis of prison diseases, so that mistakes are far less frequent than formerly.

The rheumatism of the middle of the last century is now explained by the presence of malarial parasites in the blood, anemia vanishes before the same cause and *ankylostoma duodenale*, while debility and anasarca give place to tubercle and dysentery.

The greatest enemies of the prisoner in Southern India during his incarceration are the organisms of dysentery, cholera, malaria, pneumonia and tubercle which kill between 70 and 80 per cent of those who die in prison, but for wilful destruction of prison life dysentery stands *facile princeps*.

It will be necessary in passing to review briefly the physical condition of prisoners as they are received after conviction because this has an important bearing on the subject of prison mortality.

It is fallacious to consider that the majority of convicts are received at the main gate in a state of physical wreck the result of debauchery and vice, for in so far as this presidency is concerned the converse seems to hold good. Those who are interested in this physical problem might turn to the Jail Administration Report for the year 1880. He will there read on page 28 the following remarks: "Convicts as a class are men of a low physical type, brought up under conditions unfavourable to health, early given up to vicious courses and with constitution in many cases ruined and impaired by excess. It is therefore not surprising that when denied all the comforts which men of the prisoner class usually allow themselves and when placed on a coarse but wholesome diet, reduced down to the barest necessities, men should lose flesh on first admission to jail. Up to a certain point this loss does not bring with it any perceptible diminution of physical power except amongst those of weak and enfeebled constitutions. As regards the effect of prison life on the physical condition of convicts as tested by weight, it may be stated that the robust men gain in weight and *ceteris paribus* in health, whereas men who are delicate on reception lose in weight and do not as a rule improve in weight."

The foregoing extract written many years ago cannot be accepted as correct and the individual who penned these remarks was oblivious of the fact recorded by him

self that over 90 per cent of the newly-admitted prisoners were in good health on arrival, the remainder being weedy and "social wrecks." The figures of any other prison year will show a similar state of things and prove that the majority of prisoners arrive in the best of health, and not in a weedy condition as was supposed. It is true that in every prison a certain proportion of prisoners, who, through depression of spirits, change of habit and of diet, decline in health especially on admission. Such persons are in a minority and add in an imperceptible degree to the death rate owing to the special care bestowed on them, so as to tide over this dangerous period of their incarceration. On the other hand, it may be contended that prison life, instead of having a deleterious effect on health, is beneficial. The weight statistics for the past 30 years demonstrate the fact that prisoners gain in weight after admission, and that those in indifferent and bad health are in many cases restored to health by the regularity of the life they are compelled to lead and the care bestowed on their health. The removal of the prisoner, whose health may have been vitiated by excess to within the circular walls of a prison is salutary. His ailments, the result of unbridled license are attended to and cured. His labour is adjusted to the state of his health, he is far better housed than in his own village, he is fed plainly and well, he is far removed from perhaps a nagging wife or teething babies, and he lives a life of comparative comfort. The prisoner of to-day is looked upon as an individual whose neurons co-ordinate abnormally (a moral disease acute or chronic), and in consequence the main object of prison administration is to quarantine this degenerate, so that he is for the time being kept from committing further wrong and from being a source of trouble to his neighbours. He is to be reformed by discipline, education and kindness, rather than by severity and brutality.

Were it possible to diminish still further the death rate from the prevailing tropical diseases most common in prisons, and at the same time to separate the various classes of criminals according to their grades of mental degeneracy, the prisons of the presidency might be looked upon as sanatoria for body as well as soul. In years of scarcity the prison is a harbour of refuge for many a person driven to crime through sheer want. He is glad of the "free food" of the Sirkar even though it was once described as "coarse but wholesome, reduced to the barest necessities."

The food supplied to prisoners is, however, much the same as the majority are accustomed to in their own houses. It is less sumptuous to-day than in the seventies, yet in spite of this restriction the mortality statistics are far more favourable than at that earlier period (*vide* Table I, Chart A).

In Table I with its accompanying Chart A will be found a synopsis of the sickness and mortality amongst the Madras jail population since the year 1867. The striking feature of the table and chart is the high numerical strength and death-rate in the famine years 1877, 1879, 1892. The daily average prison population in the famine year of 1897 was, singularly enough, within normal limits. The close relationship between the population and the death rate is remarkable, the curve of the one following that of the other. In the first decade 1857—1866 the yearly mortality exceeded the famine years of 1892 and 1897 by an average of nearly 50 per mille, and in one year, 1865, it came dangerously near that of the great famine of 1877 and 1878, and that too apparently in a year of prosperity. In this period the death rate during the ten years (1857—1866) varied between 71 and 129 per mille in a daily population varying between six and eight thousand. This appears very unsatisfactory when we contrast the present death-rate of 18 per mille in a jail population of over ten thousand. The restriction in the expenditure for medical comforts may have been a factor in this abnormal death-rate since in 1867 the cost per head of sick was only Rs 32 0 7, whereas in 1903 it reached Rs 125 9 9.

In reading the old jail reports one comes to the conclusion that this excessive mortality was partly due to what was considered at that time to be a special disease, *viz*, jail diarrhoea. This special disease no longer exists, although dysentery its successor remains. The chart graphically illustrates the severity of famine of 1877—1879 in its effects on the jail population and its vital statistics, and it took five years before normal conditions obtained. The recovery after the famines of 1892 and 1897, far less severe, was rapid in comparison to that of the great famine of 1877.

In Table II and Chart B will be found the main diseases which have been productive of mortality amongst the prison population of Madras. The minor places are occupied by jaundice, small pox, undiagnosed fevers, pneumonia and remittent fevers.

Pneumonia is more fatal in prisons than is generally supposed, since many of the cases diagnosed as remittent and other fevers show the characteristic lesions of pneumonia in the *post mortem* registers. The deaths from boils and ulcers, thanks to Listerism and more efficient diagnosis, have practically vanished from prison vital statistics.

The admission to hospital for malarial fever and dysentery are numerically about equal, but the death rate from the latter is eleven times greater than from the former. Malaria, however, has a direct influence in predisposing prisoners to dysentery if not in actually causing dysentery. Of the respiratory diseases the most fatal are tubercle, pneumonia and bronchitis, and if these three are grouped together they exceed by a hundred or so the deaths from cholera during the past 37 years. In Chart B, debility and dysentery occupy the highest places in the death rôle of Madras prisons and compared with dysentery all other diseases, cholera included are of secondary importance.

Debility is an obsolete term, and like anæmia, anasarca, is a cloak for faulty diagnosis. It has masked the deaths of over 2,000 prisoners. In the famine of 1877 and in the few years following over 1,100 deaths were attributed to this doubtful cause, while, on the other hand, it accounted for few deaths in the famine years of 1892 and 1897. The vital statistics have thus been vitiated by this want of diagnosis.

It has been said that tubercle has been on the increase in Madras prisons in recent years which is not so. In the accompanying Charts C and D the apparent increase is explained. As the deaths from tubercle rise, so the deaths from debility fall.

Most of these cases of debility were really dysentery, tubercle and other chronic disorders, proof of which is amply displayed in the *post mortem* registers. Three examples out of many of this want of diagnosis are furnished below—

I—Case No 3348 Kola, 30th May, 1886

Disease—Debility

Post mortem—Dysentery and abscess of the liver

II—Case No 4352 Ali Rowthan

Disease—Dropsy

13th November 1889—Remittent Fever	} Admissions to hospital
15th February 1890—Rheumatism	
15th March 1890—Dropsy	

Post-mortem—Dysentery

III—Case No 3065 Venkata Chellam

Disease—Debility

Post mortem—Tubercle of the lungs

It is needless to site more examples, and it is to be regretted in so far as regards the medical history of Madras gaols, that the prison doctors of old declined to call diseases by their proper names rather than by the ambiguous term of debility.

It is remarkable that when any prison caused anxiety regarding the health of its inmates, the prevailing

diseases were dysentery and debility, three notable instances being quoted—

I—Trichinopoly Central Jail (1882)

Total Deaths	145
Dysentery	113
Debility	23

II—Salem Central Jail (1879)

Total Deaths	73
Debility	11
Dysentery	45

III—Cannanore Central Jail (1870)

Total Deaths	27
Dysentery	14
Debility	11

Dysentery—It will now be necessary to discuss the prevalence of this disease amongst the prison population of this presidency and to review some of the likely causes of this disease. Cholera occupies a very secondary place in the vital statistics when compared with dysentery. Of 16,000 prisoners who died between the years 1867 and 1903 more than half died from dysentery and debility and only one-tenth died from cholera. This is a most striking fact, the more so since cholera is so infectious and so rapid in its results. The reason why the death rate from cholera is so inconsiderable is due to the early segregation of prisoners attacked. Had the same stringency been adopted in regard to the quarantine of those attacked with dysentery the mortality would have been appreciably reduced. During the last decade, however, the infectious nature of dysentery has been recognized with the result that the death-rate is 5.61 per mille less than in the previous decade (1881—1891). Madras prisons can now compare favourably with the average for all India (jails) in regard to dysentery. The figures are as follows—

Prisons (India)—Dysentery

1896—00=9.14 per mille

—01=7.19 "

—02=6.57 "

—03=4.66 "

Madras, 1893—03=3.91 "

It will be noticed that the average for all India has fallen from 9.14 mille to 4.66 per mille. In the jails in which the writer has been in charge he has been able to reduce the death-rate from dysentery still further, *viz*, to 2.2 per mille per annum in a period of nine years, so that it is possible to improve even on the low Madras average of 3.91 per mille.

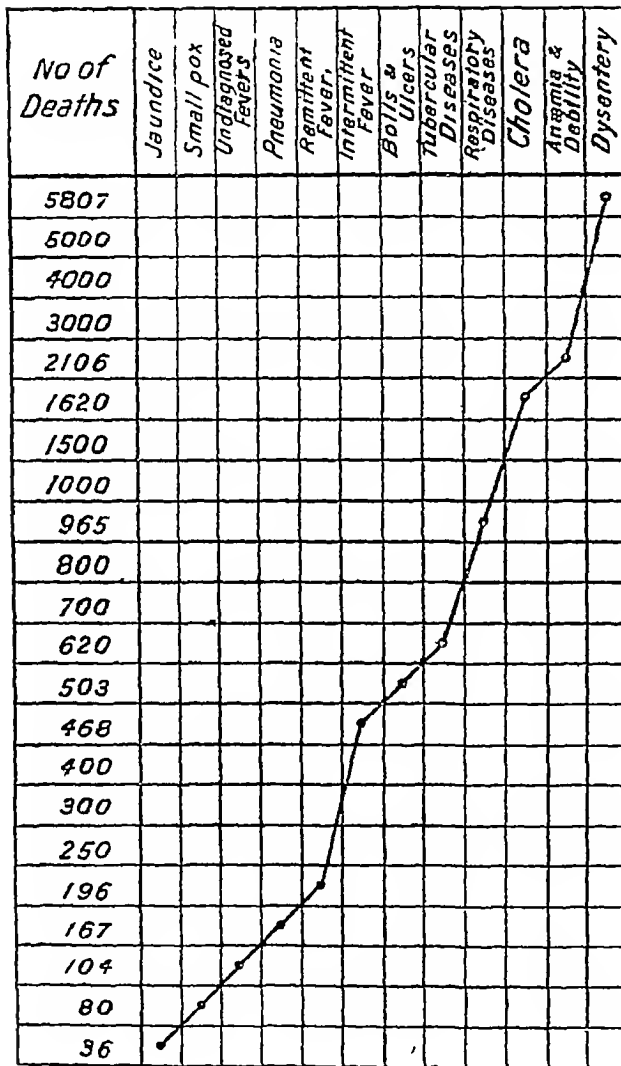
Jail diarrhoea—In the early part of the last century there was supposed to be a special disease called jail diarrhoea. The general public do not appear to have suffered from this complaint until some of them entered the precincts of a prison. In the Jail Admission Report for 1874 may be culled the following remark: "Amongst the prevalent diseases, dysentery caused the most admissions to hospital, but diarrhoea the most deaths."

In the report upon the unhealthiness of the Trichinopoly Central Jail in the year 1882 the following extract is of interest: "This is the old form of jail diarrhoea, dropsy and dysentery, which 20 years ago caused so large a mortality in Madras prisons. It is undoubtedly due to bad and imperfect nutrition whether before or subsequent to admission. I am unable to say."

The medical officer of the prison, however, gave the disease its proper name, because out of the 145 deaths 113 were returned as dysentery. Dysentery was the true disease, diarrhoea and dropsy being only symptoms. The physicians of the early fifties put the cart before the horse.

It is hardly fair at this later date to criticize the remark that "the disease was due to bad or imperfect nutrition whether before or after admission. I am unable to say," but the explanation is so simple that it is surprising that it should have been overlooked at the time. In the year in question 86 per cent of the prisoners

Deaths from various causes from 1867—1903



*Relative Age Mortality from Dysentery amongst
Prisoners confined in various Jails in the
Madras Presidency*

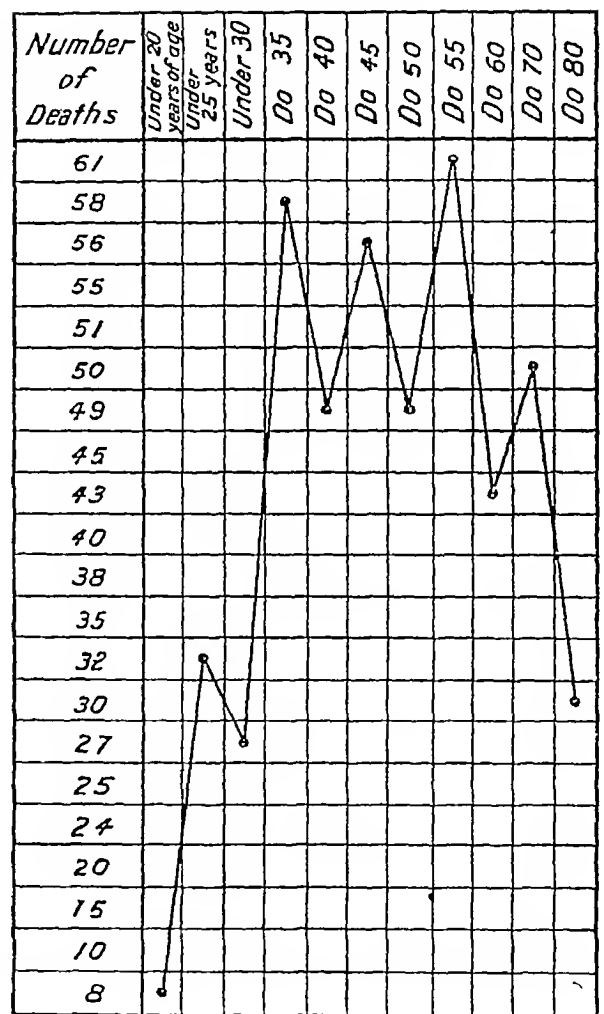
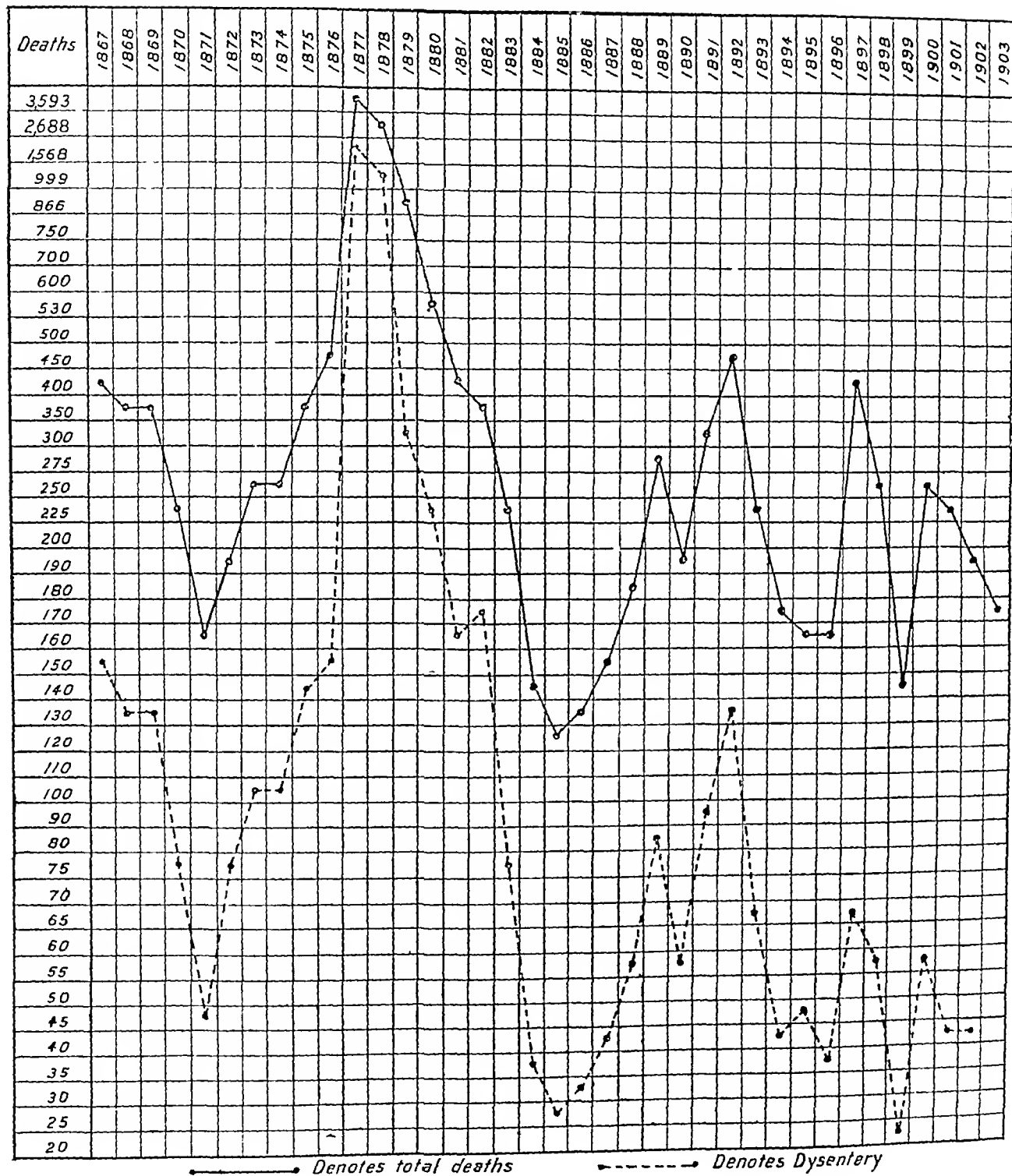


Chart E—*Total Deaths and Deaths from Dysentery Compared*



were admitted in good health, so that the malnutrition must have occurred after their incarceration, a fact subsequently proved

Food in relation to dysentery—The effect of scarcity amongst the general population is to produce an abnormal increase in the death rate which is also reflected in the vital statistics of Madras prisons

One has only to turn to the Jail Administration Reports in the famine years for proof of this—

YEAR	Total deaths	Deaths from dysentery	Cholera	Debility
1877	3,593	1,568	516	480
1878	2,688	999	110	427
1879	866	314	22	138
1880	530	230	1	77
1892	476	132	176	12
1893	224	65	18	32
1897	441	69	196	1
1898	251	57	2	1
Total	9,069	3,434	1,041	1,168

It will thus be observed that out of 16,000 and odd deaths since the year 1867 over 9,000 occurred in the famine years and in the few years following. It is also remarkable how scarcity acts as a predisposing cause to intestinal ulceration. If reference be made to the accompanying Chart E, one will observe how the dysentery cure follows that of the general death rate in prisons and how marked is the rise in unfavourable years of dear food

An analysis of the *post-mortems* of 100 famine stricken prisoners which were personally conducted by the writer disclosed the fact that 65 per cent suffered from intestinal ulceration mostly of a dysenteric nature, and that nearly 50 per cent had splenomegaly. The effect of malnutrition, therefore is, leave the individual less able to resist the malarial parasites, Leishman's bodies and the organism of dysentery

What is true of the effects of short commons amongst the free population is also true of those incarcerated in our prisons. If the weighments of the prisoners are good, the health is good and conversely, if the prisoners lose weight the death-rate rises and dysentery is the prevalent disease. Unfavourable weighments are due to bad food and under-feeding. The coincidence of speedy improving weighments and reduced mortality is striking in the following instance—

	Net gain (+) or loss (-) of total population	Number of deaths
March	-1 61	11
April	- 38	4
May	+ 05	1
June	+ 43	3
July	+ 72	8
August	+ 72	12
September	+1 36	6
October	+2 28	4
November	+2 68	0
December	+3 41	0

Needless to say the majority of the deaths were due to dysentery and diarrhoea. In some epidemics of dysentery the outbreak was attributed to the free use of rice in the dietary. As illustrative of this fallacy the following quotation may be made from the report on a prison where dysentery was raging at the time—

"Since the present scale of diet (*i.e.*, the mixed diet of rice and millet) has been introduced, a singular immunity from disease of the digestive organs has resulted. The new scale came in force in the beginning of December, and since then there have been only nine

cases of disease of the bowels admitted to hospital. During the first eight months there were 33 deaths, nine of them from bowel complaints. While the rice diet was in force I invariably found that a large number of prisoners, never under 25 per cent, had the raw, red, cracked and irritable tongue indicative of a digestive canal in a state of irritation. Since the change in the diet scale (*i.e.*, to the rough and coarse food, raggee) such appearances have become fewer and less marked."

In other words, rice given alone as the basis of jail dietary, gave rise to intestinal irritation and dysentery. In another report similar views are expressed, *e.g.*, "the record of sickness and mortality where rice was substituted for dry grain was in some instances disastrous." In contrast to these views may be cited the following—

"Rice was issued to all the prisoners on medical grounds"

Is it not proverbial that doctors differ and especially so in these instances, where rice is held to be the cause of dysentery at one time and prescribed as a remedy at another. Ask a prisoner, be he of the highest or lowest caste whether he prefers rice to raggee, one and all will reply in the affirmative since rice diet in prison is a luxury, and the days on which it is issued are looked forward to by all. It is also the diet issued to the invalids. If the diet is suspected as a cause of dysentery, then it is due not to the kind of food (rice or millet), but to the short issues, imperfectly cleaned, and coarsely ground flour and bad cooking. A notable example of this is found in the dysentery epidemic in the Central Jail of Trichinopoly in 1881-1882, which was traced to badly prepared food. The care devoted to the food can never be relaxed, for while conservancy, drainage, ventilation and even water supply when once properly settled need not filter, the washing and cleaning of the articles of diet, the cooking and distribution of the food may vary from day to day. In a population properly fed, clothed, housed, and showing a fair standard of health, the liability to dysentery will be found to be diminished.

Impure water as a factor in the causation of dysentery in Madras prisons—In most prisons the primitive arrangement of distributing the drinking water by hand-carts and open vessels is still in vogue. Although the chemical and bacteriological analysis of a sample of water taken direct from the well may be satisfactory, the probability is that the handling may render it contaminated and impure before it reaches the prisoner. The following is the number of deaths from dysentery in the various central prisons since the year 1867—

Rajahmundry	222
Vellore	137
Trichinopoly	570
Coimbatore	385
Salem	341
Penitentiary	73

The question will at once be asked why the Penitentiary situated in the centre of the presidency town is so free from dysentery. For many years the Penitentiary has been supplied with pipe water, and it is no doubt that this has had a very important bearing in reducing the mortality amongst the prisoners from dysentery. In contrast to this jail, which shows so few deaths from dysentery stands out the Central Jail of Trichinopoly with 570 deaths from this cause. In the year 1893 water was circulated by means of pipes with the result that since its introduction the death rate from dysentery has averaged only 3.6 per annum. The Central Prison of Rajahmundry has had an unenviable medical history. Dysentery has been an important item in its jail bill of mortality. In the year 1899 the writer introduced a system of shower-baths and taps for drinking water, at the same time abolishing the open bathing cisterns with the result that out of a total of 232 deaths from dysentery since 1867 only nine have occurred during the past five years.

In the accompanying Chart F will be found a classification of the deaths from dysentery in the various

months between 1880 and 1893 in the Central Prison of Cannanore situated on the Malabar Coast, where during the monsoon the rainfall is very high. In the same chart is also mapped out the bacteriological analysis of the well waters during the year 1896 carried out by the writer when he was Medical Superintendent of the Prison. It will be observed in following the curves that in those months when dysentery mortality is highest, microbial impurities are also highest. This is not surprising when one of the wells, the main supply of the prison is a shallow well, situated amongst paddy fields and surrounded by a garden manured with the prison night-soil which abounds, with the ova of *ascaris lumbricoides* and *ankylostoma*. This well contained *bacillus coli*, *bacillus fluorescens liquefaciens* and *staphylococci*, *streptococci*, &c., &c. One prisoner, while cleaning out this foetid well, almost died of choleraic symptoms. Is it then surprising that this jail had for many years caused the greatest anxiety owing to the large numbers of deaths from dysentery, debility (i.e., dysentery and tubercle), diarrhoea and cholera?

These instances will convince any one that to diminish dysentery in prisons a pure water supply is of the first importance, and that the introduction of pipe water is necessary in those prisons where it is at present non-existent.

Dysentery an infectious disease—The importance of segregation, the neglect of which is an important factor in the mortality from dysentery—It is surprising that, with this veritable holocaust of deaths from dysentery in the past, it is only within recent years that dysentery has been looked upon as an infectious disease. Formerly cholera and small pox only were recognized as diseases requiring special care in regard to segregation and quarantine. New arrivals were kept separate for a short time purely on account of these two diseases which occupy a secondary place in jail mortality when compared with that of dysentery (vide Table I). The outbreak of dysentery in the Parvatipur Hill Jail, now closed, shows the necessity of treating dysentery as an infectious disease. Early in August 1894 a serious outbreak of dysentery occurred causing 19 deaths in two months. Climate, season, food, water-supply were examined, but it cannot be stated that the causation was satisfactorily explained. There was, however, overcrowding. In June of the following year dysentery broke out as virulently as in 1894. It was held that the premises had become infected with the causative agent of dysentery. In other words insufficient care had been taken to segregate prisoners who were suffering from dysentery, which was the true explanation of this outbreak.

Intestinal parasites in relation to dysentery—*Ascaris lumbricoides*—As was previously pointed out the Central Prison of Cannanore had an unenviable reputation for dysentery and diarrhoea, and one of the causes was shown to be an impure water supply. Reviewing briefly the medical history of this jail, the following were the chief causes given by the medical authorities from time to time to account for the unhealthiness of the prison—

- (1) Deficiency of meat ration
- (2) Deficiency of antiscorbutic vegetables
- (3) Rice diet
- (4) Heavy rainfall
- (5) Draughty barracks
- (6) Coarse flour

These various defects, some of them fanciful, were remedied, and still the mortality from dysentery continued, proving that some other defect had been overlooked. The water appeared to have been above reproach which was not so, and the prevalence of intestinal parasites seems to have escaped notice. The writer's attention was drawn to this matter at his first post mortem in this jail in 1894, when a mass of 37 worms was found at the ileocaecal valve which was in a state of ulceration as also the large intestine undoubtedly

due to this living foreign body. In a monograph by the writer on this subject, it was shown that round worms frequently congregated about the ileocaecal valve, setting up inflammation either mechanically or by irritant emanations, whereby *bacillus coli*, *streptococci*, &c., gain a foothold so strongly that ulceration results extending to the large bowel which becomes dysenteric. From the year 1867 to 1893 nearly 57 per cent of the deaths in this prison was due to dysentery. Between 1885 and 1894 the death-rate from this cause alone amounted to 25 per mille. By having recourse to the free use of anthelmintics introduced by the writer the death rate for bowel affections during the eight years 1895 to 1903 has fallen to 5 per mille. In the year 1900, however, it rose to 20.59 per mille which may have been due to failure to appreciate the preanthelmintic treatment of dysentery. In Chart G will be found the results of treating prisoners on first admission to hospital for dysentery by anthelmintics. It may be pointed out that the prevalence of *ankylostoma duodenale* is as common in this jail as elsewhere in Southern India reference to which will be found below.

II Ankylostoma duodenale—A systematic search for this parasite was made by the writer in the Central Prison, Rajahmundry, in the year 1900. Altogether over 1,500 convicts were examined on arrival and the ova of this nematoid was found in the motions of 883 prisoners or in about 58.87 per cent. Of these 60 per cent arrived in good health and 40 per cent in bad and indifferent, the figures being as follows—

Prisoners in good health	894
„ in indifferent health	406
„ in bad health	209

From the accompanying Table III it will be observed that 53 per cent of the free population in the Northern Circars where this jail is situated, harbour this blood sucking nematoid and still remain in good health, which is to say that these worms do not occur in sufficient numbers in the bowel to cause ankylostomiasis. It would be expected that the better hygienic surroundings of the prison and the stricter supervision as to the cleanliness in the preparation of the food would have produced a material reduction in the numbers harbouring *ankylostoma*. The percentage remained the same in 300 convicts who had been over six months in jail, whereas the percentage of prisoners harbouring *ascarids* fell from 37 to 18.5. The investigation brought this fact to light that the ova are far more numerous in the motions of those in bad and indifferent health, and furthermore the writer found that in 105 post mortems personally conducted by himself the percentage affected with *ankylostoma* present had risen from 58 per cent to 75.

Table III

I III—Statement showing statistics of Worms passed at Cannanore in the year 1896

Months	TOTAL NUMBER OF CONVICTS		TOTAL NUMBER OF WORMS PASSED	
	In-patients	Out-patients	In-patients	Out-patients
January	1	1	3	6
February	8	6	23	57
March	8	13	39	83
April	4	5	7	36
May	5	10	18	21
June	10	18	46	116
July	8	15	38	55
August	6	6	41	31
September	4	16	23	65
October	4	19	20	170
November	7	24	110	249
December	8	14	21	62
Total to 20th December 1896	73	117	412	991

Chart F

Cannanore Central Prison Deaths from Dysentery (1880—1893)

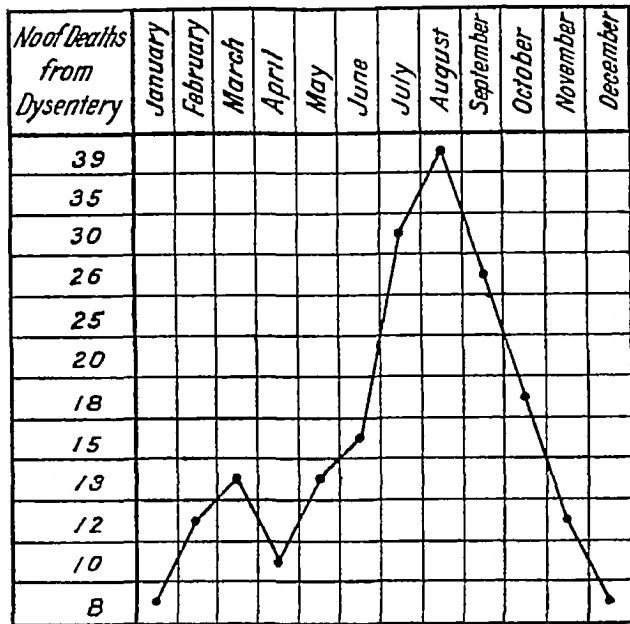
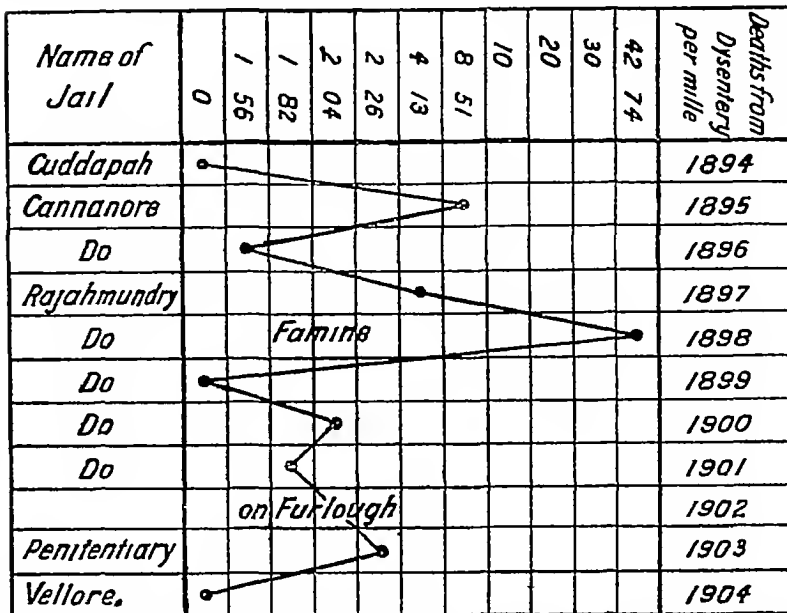


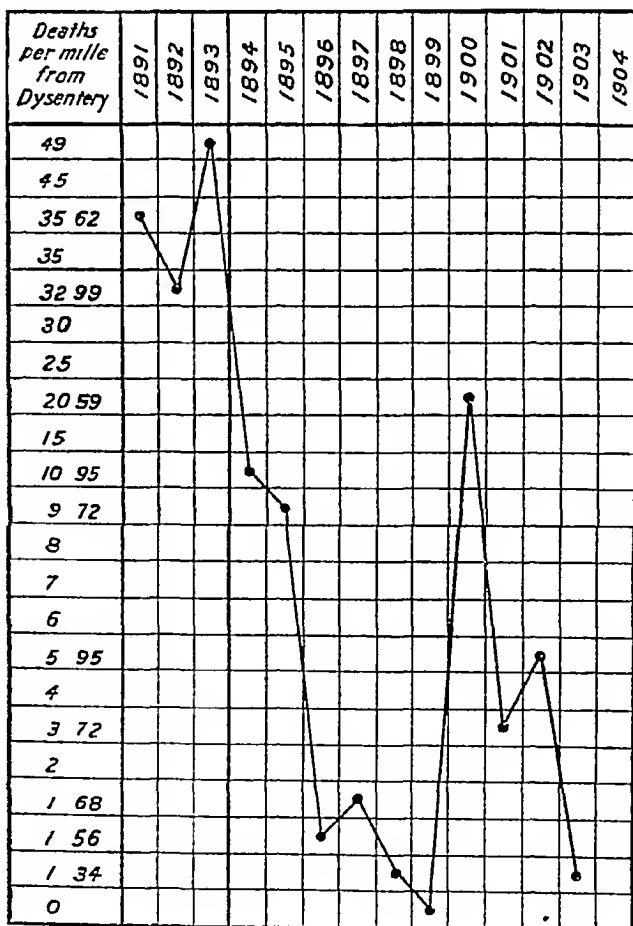
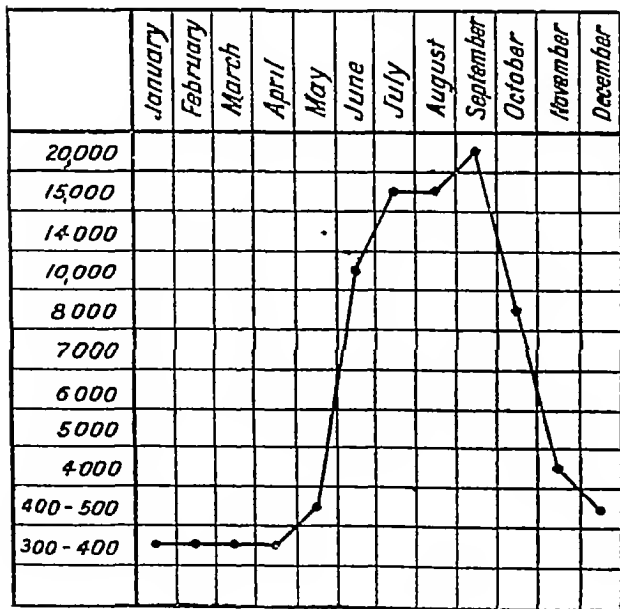
Chart G

Effects of Anthelmintics in Dysentery Cases treated by Major C F Fearnside in the various Jails in Madras Presidency

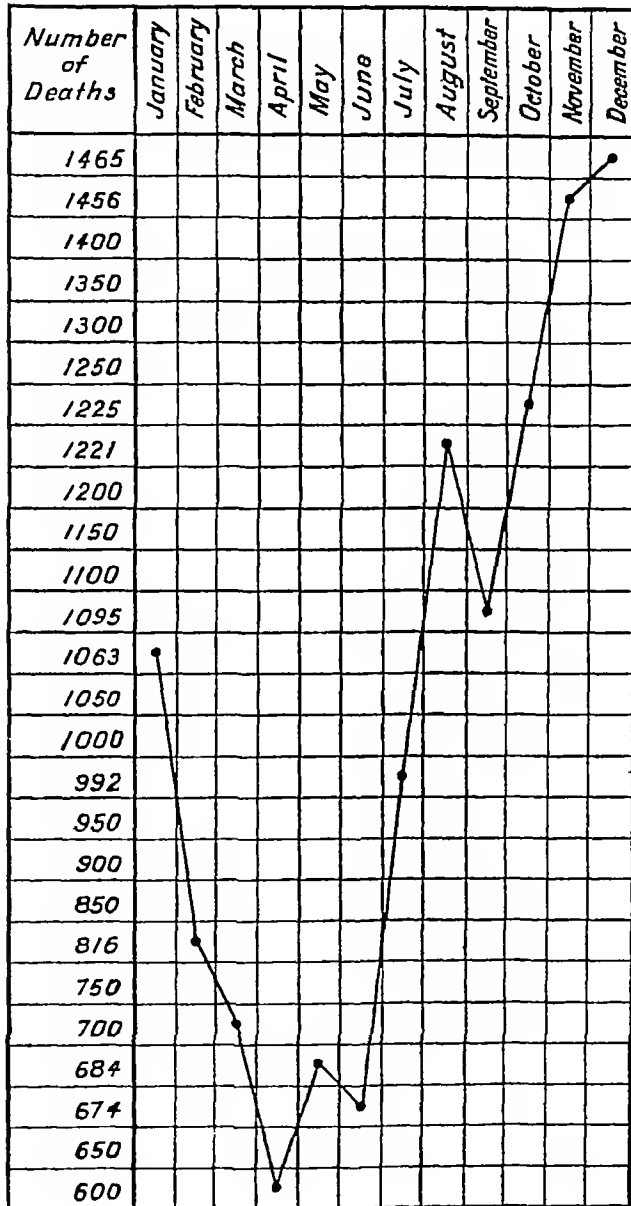


Effects of Anthelmintic treatment in Dysentery cases introduced by Major C F Fearnside in the Cannanore Central Jail in 1894

Number of Microbes per Cubic Centimetre in Well of Cannanore Central Jail counted by Major C F Fearnside in 1896



*Death for various months in Madras Jails for
1868—1887*



2 *Rajahmundry Central Jail*

Total number examined	Ova of Ankylostoma	Ova of Ascaris lumbricoides	Ova of Trichocephalus dispar	Ova of tapeworm
Number 1509	883	633	131	3
Percentage	58.87	42.2	8.7	20

3 *Health of the convicts harbouring Ankylostoma Duodenale at Rajahmundry*

	Good	Indifferent.	Bad
Numbers affected	475	229	179
Percentage	53.8%	25.8%	20.4%

4 *Double infection with A Duodenale and A Lumbricoides*

Total Examined	Double infection	Health good	Health indifferent	Health bad
Number, 1509	364	167	101	96
Percentage	24.5	45.7	27.7	26.8

5 *Analysis of 200 convicts who have served 6 months and upwards*

	Ankylostoma	Ascaris lumbricoides	Trichocephalus dispar
Number of cases in which ova was present	116	37	10
Percentage	58.0	18.5	4

An analysis of 361 deaths in Rajahmundry Jail reveals the fact that 175 had ulceration of the large bowel. This figure (50 per cent approximately) would have been much higher, but for the fact that 114 were without any record as to the state of the bowel, the experience gained in this prison goes to prove that the effects of ankylostoma are secondary rather than primary. None of the patients treated for dysentery were free from this parasite.

Their presence retards recovery, they bleed the patient who can ill afford it, they set up local erosions and supuration of the bowel and thus interfere with the proper assimilation of the food, and open a channel by which organisms enter the general circulation, and perhaps the recently discovered Leishman-Donovan bodies find their way to the spleen by this channel.

Malaria in relation to dysentery—The Rajahmundry Central Prison has a notorious history for malarial fever, yet in spite of this fact whenever this prison became more unhealthy than usual the cause was ascribed to beri-beri. In a monograph on this jail the writer showed that beri-beri was a synonym for debility which has been proved to be chiefly dysentery and tubercle. Of 34 deaths from beri-beri in Rajahmundry Jail and of 20 transferred to Vellore for this disease he finds that 30 died of dysentery and seven of tubercle. One was so saturated with pyphitis that no *post mortem* could be made. In contrast to this the administration reports show that this prison between the years 1880–1897 accounted for 60 per cent of the admissions for malarial fever in the seven large Central Jails of the Presidency.

During the same period between 50 per cent and 60 per cent died with dysenteric ulceration and no other conclu-

sion can be drawn than the fact that malaria predisposes to dysentery if not an actual cause. The writer has repeatedly found malarial parasites in the slimy exudations from the bowel of those suffering from dysentery.

Mortality from dysentery according to age—It has been possible to analyse only 447 deaths from dysentery which will be found in the accompanying Chart H. It is evident that dysentery is more fatal between the age of 35 and 55 if any weight is to be attached to the analysis given in the chart. On the other hand, an analysis of 13,000 odd deaths between the years 1867–1903 the following is the relative age mortality—

Age 20–40	= 60 per cent
" 40–60	= 32 "
Over 60	= 8 "

In a former part of this paper it was shown that the death-rate from dysentery followed year in and year out the general death rate, consequently the majority of prisoners die from dysentery in the prime of life. To verify these facts more accurately, it would be necessary to procure the various percentages of prisoners admitted at different ages. This, of course, the writer has been unable to do.

Mortality from dysentery according to length of time spent in jail—It is generally considered that prison mortality is greatest during the first few months after conviction. An analysis of over 700,000 prisoners in the Madras prisons since the year 1868 does not uphold this general opinion. The following is the percentage of deaths according to period spent in jail—

Under 6 months	13 per cent.
6 months to 12 months	4 "
1 year to 2 years	3.7 "
2 years to 5 years	3 "
5 years to 10 years	4.6 "
Above 10 years	2.4 "

As the deaths from dysentery are in keeping with these percentages, it will be seen that it is after six months' incarceration that the deaths from dysentery become appreciable.

Case Mortality (Dysentery)—Since the year 1894 there have been nearly 11,000 admissions to hospital for dysentery in Madras prisons, and of these 4 per cent have died. This does not appear excessive, but may be reduced. During the same period the writer has treated over 1,000 patients suffering from dysentery and the case mortality was only 1.4 per cent.

Seasonal Mortality from Dysentery—In Chart K is an analysis of deaths according to months in the Madras Jails from 1868–1887. It has been impossible to procure any figures at a later date as no records were made in the administration reports. The most fatal months are the winter months, and if we assume that the mortality from dysentery in the main follows the general death-rate to be correct, then dysentery is most common in the winter months. It has been shown that in the case of the Cannanore Central Prison dysentery is most fatal in the monsoon months. This jail with the exception of a small District Jail, namely, Mangalore, is the only prison on the West Coast where the rainfall is excessive. With these exceptions it may be concluded that dysentery is more fatal amongst prisoners in the winter months, October to February.

Abscess of the Liver in Dysentery—Contrary to what one would generally suppose abscess of the liver as a sequel of prison dysentery is extremely rare. In 500 cases of dysentery it only appeared in 1.8 per cent. Yet many of these patients, admitted for dysentery, display the presence of amœbæ in the bowel. Jail dysentery, therefore, is not frequently followed by abscess of the liver.

Points of pathological and bacteriological interest in regard to Dysentery—In reviewing a large number of *post-mortems* in several prisons, the writer was struck with the large number of signs of old pleurisy, which is not surprising since the man in the bazar wears much the same amount of clothing, summer and winter, sunshine

and shower. These pathological signs of pleurisy in many cases pointed to the person having had pneumonia as well, which in the opinion of the writer is more common in prisons than is generally supposed, and is proved by the pneumonic condition of the lungs in numerous cases returned as simple continued fever, remittent fever, and even dysentery. In many of these where pleuro pneumonia inflammation had taken place there were found to be old cicatrices just above the ileocaecal valve and scattered about the colon. In a number of patients who died of pneumonia the records state that there was ulceration of the large gut. In quite a dozen cases of pneumonia which has come under the writer's charge there has been dysenteric ulceration and the diplococci pneumonia were present in the ulcer. In these cases there can be no doubt that Frankel's pneumococcus and the streptococci of purulent inflammation were the cause of the dysenteric ulceration. Where the flora of the bowel is so multifarious and varied, it would be dangerous to pin one's faith to any given organism as the cause of dysentery in prisons and much more research is required in this direction. The writer has detected Shiga's bacillus, amebæ dysentericæ and Leishman-Donovan bodies but to say that any one of these was the actual cause of the dysentery would be difficult, since there are so many organisms present in the gut. In any ulcer of a dysenteric nature a microscopic smear will disclose many more staphylococci and streptococci than other organisms alleged to be the specific cause of dysentery.

All will admit the far reaching effect of the ordinary staphylococci and streptococci which are frequently present in the normal bowel, and should these find a lodgment on any weak spot they at once set up inflammation, ulceration, and purulent discharge. A dysenteric ulceration may be produced in the bowel of a rabbit by injecting the organism of pus into the wall of the gut. This is far from saying that there are not specific organisms, but the writer contends that the staphylo and streptococci play a very important part in the extension of the disease and even in starting the disease itself. Cultures from the œdematous swellings on the walls of the colon in a state of ulceration frequently disclose the organisms of inflammation only, so also cultures from the sago grain spots in certain cases of dysentery. Our knowledge of the bacillus coli group is still in its infancy, and much of the dysentery met with in jails may be due to one of this group. In three cases of dysentery the writer found last year Leishman Donovan bodies. In others the prevailing animal organism were monoflagellates which may be of pathological importance in producing dysentery.

The writer has also met with cases of colitis which had all the symptoms of cholera yet no Koch's bacillus was found, the prevailing organism being a diplococcus. In another jail special organisms found the well waters (e.g., Cannanore) were most commonly met with in the ulcers. With such a variety of microbes, &c., in the bowel it is difficult to state that any one is the special cause, but that probably several have an important helping hand in the production of dysentery. As regards microbial dysentery, it would seem that a polymicrobial serum will be necessary for the serum treatment if ever that becomes successful.

Dysentery, Treatment of—Owing to the prevalence of intestinal parasites amongst the people of Southern India, an endeavour should be made to treat with anthelmintics all prisoners who come to hospital complaining of diarrhoea or passing mucus and blood in their motions. The results of this treatment have been alluded to in a former part of this paper which justify its recommendation. In all cases of dysentery the writer prescribes a preliminary dose of santonin as soon as the patient comes to hospital followed the next day by castor oil and opium. If the ova of ascaris lumbricoides are still present in the motion the santonin treatment is continued. The patient under this treatment frequently recovers, the mucus and blood

disappears and diarrhoea stops. Should the dysenteric symptoms continue the patient is next treated for a few days with a saturated solution of Epsom salts (15 grs. to 1 oz.) By this means much of the mucus and slime is got rid of, and should there be any ulceration the ulcers are cleaned, and congested areas are relieved. About the fourth or fifth day bismuth and salol in large doses are given four times per diem, and if there is much pain then opium is added. In very bad cases enemas of boracic acid and arrowroot are injected, but that only when the descending colon and sigmoid or rectum are involved. This has been the stereotyped method of treatment employed by the writer during a jail experience of over twelve years and his case mortality has been reduced to a little over one per cent. Other medical officers no doubt employ exactly the same treatment, yet their results may not be so satisfactory. There are other points to be attended to besides the mere medicinal treatment and that is the dietary, or one would rather say, the want of diet.

Native patients think that provided they get enough food they will recover, and that in dysentery the more they eat the sooner will be their convalescence. The great difficulty in the treatment of dysentery in prisons is in keeping the sick prisoners from getting food which they are forbidden to eat. Their fellow prisoners give part of theirs away in charity as the dysenteric complains of the pangs of hunger.

Whenever a patient is not improving the writer constantly suspects this cause and takes all the steps he can to either keep the prisoner in a separate ward by himself or in a cell with a sentry who is held personally responsible that the patient receives no other food than that prescribed and he is warned that the microscope will reveal the slightest error in this direction.

One of the most important points to attend to in the treatment of dysentery in prisons therefore is the prevention of patients receiving the rough and coarse ruggee diet which is irritant in dysentery unless the flour is specially well ground and cooked. Every care should be taken to disinfect the motions, and if possible to burn them. Should this not be done these dysenteric motions may be mixed up with the general night soil, which in a few months is used for manuring the garden and possibly contaminate the vegetables. Patients who are convalescent and discharged from hospital should be kept together for some months as relapses are fairly common, and they should be examined from time to time and their weighments carefully noted, any loss of weight at once indicating that there is some mischief still going on.

Conclusions and Recommendations

1 Dysentery in the Madras prisons has accounted for the majority of deaths during the past forty years.

2 Many diseases such as debility, anasarca, &c., now not recognized as such, were in reality dysentery.

3 Scarcity and bad food predispose to dysentery both outside and inside the jails of the presidency.

4 Impure water has a similar effect, and the obsolete arrangement of the hand delivery of water should be abolished at an early date, taps and shower baths being introduced.

5 Dysentery being an infectious disease should be treated in an extra mural hospital specially built for the purpose.

6 The abolition of the association wards and the introduction of the cellular system is most essential and is an excellent preventative for the spread of any such disease since the person attacked is practically segregated where as in a barrack this is not so.

7 The abolition of mud banks and the introduction of plank beds, the former being septic and insanitary.

8 Patients who have suffered from dysentery should be kept separate for some time during convalescence as they are dangerous to the community within the prison.

9 The free use of anthelmintics in the treatment of prison dysentery since so many harbour these internal parasites

10 Special care, during treatment, should be taken to prevent dysenteric patients receiving food other than that prescribed

DYSENTERY AS IT OCCURS IN JAILS WITH REGARD TO ETIOLOGY, PRO- PHYLAXIS AND TREATMENT

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It must be clearly understood that the disease, as it occurs in jails, is in no way different from that occurring in the free population, the only difference is one of severity, being more virulent in certain jails, and thus I put down to the large number of men confined in a certain space, not necessarily overcrowded, to the depressing effect of jail life, and in certain cases to bad sanitation and the difficulty of segregation. Before proceeding I hold that there are two kinds of dysentery. One true dysentery which is specific, and a non specific variety, and unless this is clearly borne in mind, the treatment and prophylaxis taken can only be haphazard. In both cases blood and slime is passed with tenesmus, but the cause in each is different and wide apart. In true dysentery or specific dysentery the cause is either amœbæ or bacillus. Dr Craig divides dysentery into two kinds 1st, specific or bacillary which includes the chronic form of acute dysentery due to the bacillus of Shiga, and 2nd, the amœbic, the specific form is "differentiated from amœbic by the absence of amœbæ in the feces, and in a majority of cases by the occurrence of agglutination of the pure culture of Shiga bacillus by the blood serum of a patient suffering from the disease or by the isolation of the bacillus from the feces from the intestinal ulceration," both these cases I group under the heading true or specific dysentery, and my second variety, non specific, due to error in diet, chill, &c. The literature on true dysentery is voluminous, but I have seen little or no mention being made of the non-specific variety, and as I have no doubt that the etiology of specific or true dysentery will be fully written on by others who have been asked to contribute to this special number, I will leave that part as to etiology alone. The passing of blood, slime and tenesmus are only symptoms, and can be brought about by congestion of the portal system with inflammation of mucous membrane of elementary tract, and I hold that any cause producing congestion of portal system and inflammation of the mucous membrane will produce all three of these symptoms, but this is not dysentery, but can and is mistaken for it, the treatment is necessarily different as well as the prophylaxis to be used.

To differentiate the two groups I will give examples

(1) Infectious or specific variety. When in charge of the Nagpur Central Jail, I did not believe in dysentery being infectious until my eyes were opened by the following case. After lockup a new prisoner was admitted to jail in very bad health suffering from dysentery and leprosy, he was taken straight to hospital and put between two prisoners admitted to hospital, one for ague, the other for a bad sore on the foot, otherwise both these men were in good health. The next morning on my visit to the hospital, the new admission I had removed, not that he was suffering from dysentery but on account of his leprosy which was very offensive. Five days after both men who were on each side of him contracted dysentery. Three days before both complained of uneasiness in the abdomen, felt more than seedy, bowels moved more than once a day. This is the true or specific dysentery. There is a period of

incubation which I believe to be about five days a feeling of general malaise which terminates in bloody slimy stools with tenesmus. In those days a germ was believed to be the cause of dysentery but had not been found.

(2) A strong healthy prisoner feeling perfectly well, picks up in the garden raw radishes, pumpkins and gorges himself with it, he then drinks a large quantity of water, lies down and goes to sleep, the first part of the night being hot, he perspires freely, during the second half of the night a cool breeze springs up and passes over his naked body, chills him. On awaking in the morning he has pains in the abdomen, and has one or two loose motions, for which he comes to hospital. On examination it will be found that there is tenderness over the liver and abdomen. A few hours after the motions will become more fluid stained with blood and mixed with slime and staining at stool but not marked. As the case proceeds more blood and slime is passed with tenesmus, a certain amount of griping being present. Another sign which I have found present is in the second variety, on examining the anus the hæmorrhoidal vessels will be found turgid and swollen, this I have not found in the first variety and to me is a diagnostic point between the two varieties. To summarise, in the first the onset is slow, taking several days to appear, the patient feeling seedy and out of sorts. In the second, the onset is sudden. In the first, none or very little tenderness over the liver, the second marked tenderness over liver. First tenderness on pressure in left iliac fossa, in second very little or none. In the first, hæmorrhoidal vessels normal, in the second, swollen and turgid. Both pass blood slime with tenesmus, yet both as to the cause are totally different and require different treatment.

Now let us see if treatment bears the above out. Take a case of patient passing blood slime and tenesmus. If it is a case of true dysentery then large doses of ipecac or iodoform with belladonna and opium acts as a charm and cures, but, on the other hand, I have seen cases in which large doses of ipecac have been given with no result at all, and in one case when dysentery was common, was told that ipecac had been given in large doses but was no use, in fact ipecac was useless in dysentery, these cases turned out to be the non specific variety were due to badly cooked and unwholesome food, and on giving saturated solution of mag sulph with due attention to the food the disease rapidly came under control. To give mag sulph in the case of true dysentery is absolutely useless, and only causes more distress and harm to the patient. It was laid down when mag sulph was advocated in cases of dysentery that the drug should be given, watched, and if the blood and slime after a certain number of doses was not diminished, it should be stopped. If it were not for the distress given to the patient, I would recommend the giving of mag sulph to clear up the diagnosis, give it in every case, and if blood and slime after four or five doses decreased, return the case as non specific dysentery, but if not, then call it true dysentery.

In malaria I have seen cases passing blood with a certain amount of mucus but with no tenesmus. I do not refer to the cases reported by Major S F Clarke, R.A.M.C., in the Journal of Royal Army Medical Corps for August 1904, but to cases which on admission to hospital have malaria, but after few days pass blood and mucus. It is difficult to say whether these are mild cases of dysentery supervening on malaria or a complication of malaria, I am inclined to believe that the latter is more likely, more especially after reading Major S F Clarke's paper in which he states in certain cases of malaria he has seen large quantities of blood passed per rectum, these cases I take to have occurred in Europeans. I have never seen it in natives, but have seen cases when there has been small quantities of blood and mucus. I simply mention these cases as I have seen them diagnosed as dysentery, the disease being changed from malaria to that of dysentery. Dysentery can supervene on malaria and is a serious complication, which, when it does occur

leaves no doubt as to its being dysentery, but the cases of small quantities of blood and mucus should not be for this reason. A man suffering from ague is debilitated, and if he is removed to a ward where dysentery cases are treated, is fully certain to contract the more serious disease, whereas if this point is borne in mind, he will be left in the general hospital and no harm will be done.

Another form of dysentery which occurs in jails is that caused by malingering. On visiting the contagious cells, I was informed by the hospital assistant that he had admitted the evening before a case of bad dysentery, the last stool of patients in these cells are kept for my inspection. On looking at the stool of this case, I noticed the feces were liquid, and there was a large quantity of blood, partly mixed, and some on the surface. I then went in and saw the man, he appeared very bad, and was groaning. I got him out of bed and examined his rectum where I found a wound. On going to the back of his cell, I poked up a piece of stick about six inches long covered with blood. The serious case of dysentery turned out to be a case of hæmorrhage from rectum caused by a wound from a piece of stick. The patient received appropriate treatment which cured him at once. The last motion passed by a prisoner in contagious ward being kept for inspection can lead to malingering, with the connivance of the sweeper. In another case a prisoner was kept for nearly five days in hospital with dysentery, a most perfect dysenteric stool was shown me every morning, but it was another patient's.

Dysentery is a most difficult disease to simulate on account of the peculiar character of the stool, the first case is common but clumsy, and can with very little care be detected, but in the second more difficult as the difficulty in feigning dysentery is the stool, and if the patient with connivance of the sweeper can be supplied with one is more than difficult to detect.

What is the cause of dysentery? There is very little doubt that the cause of specific dysentery is either a bacillus (Shiga), or an amoeba which, with the help of the microscope, can be differentiated. Of these two varieties of the disease that caused by the bacillus, I have found more intractable and fatal, the milder cases being due to the amoeba. In the first all the symptoms are greatly increased. The stool containing large quantities of sloughing mucous membranes are very offensive, and the disease runs a very rapid course in a great many cases. It was this variety that was prevalent in the Central Jail of the Central Provinces. At the time I saw these cases the germs had not been discovered, but on looking back with the present knowledge, there can be very little doubt as to the variety. At the post-mortem the mucous membrane of the large intestine was enormously thickened, black in colour, and sloughing in large patches, the lower part of the small intestine being affected to a certain extent. I saw a very large number of these cases which were almost all fatal. Those that recovered were left in a miserable condition and am almost certain succumb later on. The smell from these cases is almost diagnostic, and once smelt can never be forgotten or mistaken. Now the milder case I believe to be due to the amoeba. There is slough in the stool. Very little fecal matter, the stool generally consisting of mucus in lumps, mixed with blood, with very little or no smell when first passed. That due to the bacillus when first passed is almost unbearable. If some of the stool when first passed is put under the microscope, the amoeba will be seen. These cases I find under proper treatment rapidly get well.

Prevention—Don't misunderstand me. I hold that dysentery in any jail in an epidemic form is inexcusable and clearly shows that the prevention of the disease is either not understood or cannot be carried out.

In Hospital —

- (1) Every case of dysentery should be treated apart

- (2) Stools should be guarded from flies as I believe they are the cause of the spreading of the disease

- (3) All stools should on being passed be disinfected and afterwards burnt

- (4) Clothes, beddings, &c, boiled and washed Out of Hospital —

- (1) Scrupulous cleanliness in the latrines and rapid removal of the stools

- (2) Burning straw and leaves in the latrines to keep out flies

- (3) Latrine washing platforms washed down at once and the water removed

- (4) Careful trenching fires, forming quantities of smoke, being placed to windward to keep off flies

- (5) Careful attention to the cooking of food, and cook house kept free from flies by gauze netting

Every case of dysentery should be segregated, as without this it is hopeless to stamp out dysentery in a jail, and it is because this cannot be carried out in certain jails, that dysentery is so prevalent in these jails, but this point is not everything. I have known jails where segregation has been carried out and yet dysentery is prevalent, but it will be found that though the patient is segregated and his stools burnt, yet dysentery is present. In these cases the stools are not protected from flies, they swarm on the stool and then fly away to different parts of the jail carrying the infection with them. To stamp out the disease and prevent it occurring, all the precautions given, both in hospital and out of hospital, must be rigidly carried out. I know the difficulties to be overcome in certain jails which have not a contagious ward more especially in a Central Jail is more than difficult where long term prisoners are confined, yet it is possible even in these cases to make arrangements. In Jabulpur and Raipur I had grass huts built outside this jail in which all cases of dysentery were treated, but these were extremes cases on account of the large numbers. Every jail should have six cells built open at both ends in which cases of dysentery and other contagious disease could be treated, and until this is carried out although to a certain extent dysentery could be held in check with other precautions, yet without them the jail hospital accommodation is not complete. Each of these cells should have a brick floor well cemented about one foot below the general surface, this space being filled in with dry earth, which is removed after each patient, the whole cell being whitewashed after each case.

(2) Stools should be guarded from flies, this I consider a most important point as I believe they are one of the means of spreading the disease. I have fed flies on freshly passed dysenteric stools, have examined them shortly after under the microscope, have found the amoeba in the contents of the stomach, and I believe (which requires confirmation) the amoeba in the cystic stage in the muscles connective tissues, glands of intestine. If the latter is confirmed, it will be seen how in cases of dysentery due to the amoeba can be spread by flies. Anyhow whether the above is right or wrong, it is not pleasant to have a fly first sitting on a dysentery stool, and then to sit on one's bread or drop into one's *dal*. The following is my method of preventing flies from getting access to stools and at the same time disinfecting the stools. A is a glazed pan in which is put carbolic acid—B is an ordinary earthenware vessel—not tarred, this is placed in the middle of the glazed vessel in the carbolic, the carbolic percolates through and so disinfects the stools. C is an earthenware cover tarred inside and out and is placed over the vessel in which the stool is passed. Now, here is difficulty no native except a sweeper will touch this cover. At night as the cells have to be locked, the sweeper cannot lift the cover, so during the night it is not used, which, with the exception of the smell which a native will sooner endure than touch the cover, does not matter as flies do not move or eat at night, but during the day the

cover is kept on, and the sweeper called each time the patient requires to go to stool. The smell to a certain extent is covered by the carbolic. No fly can get in and no smell get out as the carbolic lotion forms a water trap. The cover is taken off and replaced after each stool. The glazed pan is large enough to allow him to use it to pass his urine in a receptacle for his ablution water, the carbolic acid disinfects it.

(3) I have included in above the 1st group of No 3. Now as to the second part, the most important, as there can be very little doubt that like typhoid, cholera, &c., the stool contains the infected matter. Each stool has a handful of quicklime put on it well mixed and then put into an iron receptacle, this has a cover to it and is placed in the incinerator. It is found very difficult to burn each stool as it occurs, hence they have to be collected and quicklime well mixed is quite sufficient to destroy all germs and amœbæ, but to make quite certain the whole are burnt. The fire is lit early in the morning and allowed to burn all day, in the evening the feces collected during the day are placed in the incinerator, it is fired and allowed to burn all night.

(4) A mackintosh is placed under a sheet to keep the mattress clean. Sheets are changed daily and boiled in water with hydrarg. perchlor and blankets boiled after each case.

Out of Hospital—The precautions to be taken out of hospital are just as important as those when in hospital as cases occur outside the hospital, though of course it may occur in the hospital. Should a case occur and one or two motions passed from these stools, unless precautions are taken the disease can be spread far and wide over the jail.

(1) Scrupulous cleanliness in the latrines and rapid removal of the feces.

The test of a clean latrine is that there should be no smell half an hour after the feces have been removed. On passing through a latrine half an hour after it has been cleaned there should be no smell, if there is, the latrine is not clean. The sweepers should commence removing the feces immediately after the last batch of prisoners have left.

(2) Straw and leaves should be burnt in the latrine all day to keep flies out, as flies won't enter when there is smoke. An old kerosine tin with holes knocked all round makes a good receptacle for leaves, straw, dry grass, &c., the fire burns slowly and makes large quantities of smoke. Should any prisoner be in the early stage of dysentery or any other infectious bowel complaint, the rapid removal of the feces and the prevention of flies feeding on these infected stools will prevent the disease from spreading.

(3) Another precaution which, if not carefully watched, is apt to be neglected is the washing platform. The water is removed but the platform is not washed, and the country being dry, the water is soon evaporated, leaving the solid parts behind which day after day does not take long to form a considerable layer of filth. The platform should be well washed immediately after and about once a week tarred, about once a month the platform should be covered with dry grass and leaves and set alight, this with the old tar soon burns and cleans the platform, when it is again tarred.

(4) Trenching should be most carefully carried out. It is absolutely useless leaving it to natives, as they will not, to save themselves trouble, carry it out, as it should be. There should be three inches of night-soil and nine inches of dry earth in the hot weather. In the rains, three inches and eighteen inches of soil, as wet soil is not such a perfect disinfectant or deodorant as dry. Fires should be kept burning, the waste from garden being set alight keeps off the flies.

(5) Careful attention to the cooking of food and keeping the cook-house free from flies.

Badly cooked food means carelessness in its preparation and hence dirt. A native to save himself trouble in cooking food, more especially if it is not for himself, is not careful as to cleanliness. Badly cooked food and

dirty kitchen are almost always found together. Now badly cooked food causes dyspepsia, and diarrhœa is a cause of dysentery, the bacillus or amœbæ being present, the prisoner being debilitated from dyspepsia and diarrhœa is in a fit state to contract the disease. Again dirt is a predisposing cause to diarrhœa, &c., and in a jail should never be allowed. Well cooked food and a clean kitchen will save the medical officer hours of work in his hospital, it takes five minutes to inspect a kitchen, which is time well spent. It should be inspected daily. The food as one walks round can be seen at a glance and after a little practice can be at once seen whether cooked properly or not. Flies are difficult to keep out, but with wire gauze nets it is quite possible.

Now as to the non specific variety, the chief precautions to be taken are—

- (1) Prevent prisoners eating raw vegetables,
- (2) Properly cooked food, and
- (3) Prevention to chills.

If the above precautions are systematically and rigidly carried out, dysentery can be stamped out and prevented in jails. Cases are imported, and should these precautions not be taken as daily routine, the disease is admitted into the jail, and may take considerable time to stamp it out. The bacillary variety is not so prevalent as the amœbic variety, the latter disease when once admitted into a jail will always be present. I believe nothing short of evacuating the jail for at least six months and having all buildings white washed, the well emptied, cleaned and disinfected, the soil turned over once or twice during this time, will eradicate the disease from the jail. The amœba perishes soon after it is passed unless, as I believe, it gets entrance into a fly, when it survives, and if precautions are taken to keep off flies can very soon be stamped out, but up to date the lurking place of the bacillus—whether soil, water or where—is not known, and hence means for its destruction can only be taken by removing one place of its survival, viz, the human body and the next disinfecting the soil, water, buildings, by these means only can the disease be removed.

Dysentery is a disease, especially in a jail, where the superintendent, a medical man, has great powers in enforcing cleanliness and general sanitation, that should not occur as an epidemic disease. A few sporadic cases are almost impossible to prevent, and in these sporadic cases, whether admitted or occurring in an old resident of the jail, are the centres for the spread of the disease if the sanitation and precautions named are neglected.

Treatment—Prevention is better than cure.

I. Specific case—One sees these cases in jails in its earliest stage, and as the prisoner is only too glad for any excuse to come to hospital—although in some I have found that the disease has very far advanced before coming to hospital—can the disease be cut short. I believe it can, but there is always the doubt, was this case a true specific case or a non specific case. Every case that comes to hospital in the early stage is given 1 ounce castor oil, 30 minims of tinct opii and put on milk diet. Under this treatment I have seen cases during an epidemic recover in two days and be fit for work, but this is the exception. The castor oil clears the bowels. The next day large doses of ipecac with opium is given or Dover's powder, but for the last three years I have given the following with considerable benefit—

R.

Iodoform	gr	iv
Ext. Belladonna	grs	½
Ext. Opii	gr	1
Mucilage	3	1

Three times a day

Under this treatment the bad symptoms are soon brought under control in a very much sooner period than with ipecac. Of course there is the disagreeableness of the iodoform. I have found the above most useful both in the amœbic and bacillary form of dysentery and can recommend it for chronic cases.

as well. The non specific variety after the close of castor oil and opium are generally cured in two days. If not, I give saturated solution of mag sulph which generally brings the case to an end. Treatment and prophylactic for the cases of malingering is counter irritation applied to the buttocks—it cures at once, and is marvellous. What a powerful preventative to this form of disease it is.

THE RELATION OF ORAL SEPSIS TO DYSENTERY

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SINCE the year 1900, when Dr William Hunter originated the term "oral sepsis" to denote "the various effects of streptococcal and staphylococcal infection found in the mouth," the subject has been attracting increasing attention. The importance of these effects have been further emphasised by a discussion in the Section of Dental Surgery at the Annual Meeting of the British Medical Association held in July 1904.*

In opening that discussion Dr Hunter alluded to many diseases in which he had found pyogenic infection from the mouth to be a cause or complication. These affections form a large and varied group, many of them are very severe, including numerous gastric and intestinal disorders.

An experience of the Central Jail at Midnapore, dating from February 1904, has led me to the conclusion that oral sepsis is a prominent feature of the dysentery and diarrhoea which are so prevalent among the prisoners there. The condition also reacts unfavourably on the general health of the convicts, and exists in a marked degree among the cases of respiratory disease.

Not only are dysentery and diarrhoea rife in this jail, but they are frequently met with outside as is shown by the fact that in 1903 among the 46 districts of Bengal, Midnapore occupied the 13th place in regard to the prevalence of these diseases†. The following table shows the mortality from these disorders during the past 12 years in the jail and in the district—

Mortality per 1,000 of population from dysentery and diarrhoea ‡

	1904	1903	Average of 5 years 1893 to 1902	Average of 5 years 1893 to 1897
Midnapore Central Jail	7.44	17.67	17.27	16.57
Midnapore District	60	82	75	76

The occurrence of unhealthy or spongy gums among prisoners, especially those suffering from

bowel-complaints, is familiar to many medical officers of jails, and the condition has been attributed to various diseases, chiefly scurvy or malaria, as well as to local causes in the mouth.

As the unhealthy state of the convicts' gums in the Midnapore Jail had attracted attention previous to my incumbency as Medical Officer, I took an early opportunity of making a detailed examination of the mouths of all the prisoners, and found that among a jail population of 921, the gums were unhealthy in 351, or 38.11 per cent. In order to ascertain, if possible, how far this condition was due to jail environment or to outside causes, a systematic examination of the gums of all prisoners admitted into the jail was instituted from the 1st of March 1904, since which it has been continued uninterruptedly, and has become an integral part of the routine examination of each prisoner on admission. To this had been added more recently the inspection of the teeth and tongue of every newly admitted prisoner, to which reference will be made later. It is on the result of these investigations that this communication is based, and in order to facilitate comparison with previous years the figures which have been taken are those for the first twelve months during which the systematic enquiry has been conducted, viz, from the 1st March 1904 to the 28th February 1905.

Before proceeding further it is perhaps as well to state the standard adopted for deciding whether the gums are unhealthy or not. Then inspection is insufficient, the real test is whether the gums bleed or not on pressure with the finger. If they are normal in appearance and do not bleed when subjected to such pressure, they are looked upon as healthy, if they fail to comply with this test they are classed as unhealthy. In the earliest stages this bleeding occurs at only one or two points, of which the commonest appear to be on the buccal aspect of the lower gums between the canine and first bicuspid, or between the first and second bicuspid teeth on either side. Somewhat later, though still at an early stage, a similar unhealthy condition is often found in other parts of the buccal surface of the lower gums, while sometimes it exists on the same aspect of the upper gums only, and less frequently is met with on the lingual and palatine surfaces of the lower and upper gums respectively. From these stages all gradations exist up to extensive ulceration and suppuration of the gums, accompanied in many cases by their retraction from the teeth and consequent loosening of the latter, as well as such inflammatory and suppurative conditions as obviously arise from carious teeth, unhealthy stumps, alveolar abscess and the like. While the local pyogenic state of these later stages is obvious, it may be objected that a slight tendency of the gums to bleed does not alone constitute oral sepsis. If it be conceded that gums in this latter condition are not obviously

* *British Medical Journal*, the 19th November 1904.

† 36th Annual Report of the Sanitary Commissioner for Bengal, year 1903.

‡ The figures for the district from 1893 to 1903 are taken from the above report, those for 1904 and all figures for the jail have been obtained from local records. Averages only are given for each of the quinquennial periods 1893 to 1902 and 1893 to 1897.

septic, still it seems clear that they are in an abnormal state which predisposes them to pyogenic infection, and which, if neglected, will lead to sepsis. It is for this reason that any tendency of the gums to bleed on pressure has here been adopted as the standard for determining the presence of oral sepsis.

Although sponginess of the gums is among the earliest symptoms of scurvy, in not one of the prisoners in the Midnapore Jail have any other symptoms of this disease made their appearance, and this despite the fact that in many cases the unhealthiness of the gums has been most marked and very persistent. Nor have the characteristic swollen, purple, hæmorrhagic gums of scurvy ever been met with. The condition does not therefore appear to be scorbutic.

The connection between it and malaria is equally untraceable. Indeed the figures from the 1st of March 1904 to the 28th of February 1905 shew that unhealthy gums more frequently existed among the prisoners admitted into jail even when in good health, than amongst those who came into hospital for ague during the same period. Thus of the total admissions into jail, 2,161 in number, the gums were unhealthy in 1,310, or 60.64 per cent, and in 1301 of these who were admitted in good health, a similar condition was found in 655, or 50.34 per cent, while among 360 prisoners treated in the jail hospital for ague in only 173, or 48.35, per cent, were the gums affected.

The cause of these diseased gums is, I think, to be found in local conditions in the mouth, such as calcic inflammation from accumulations of tartar on the teeth, pyorrhœa alveolaris, diseased teeth and the like, all of which are productive of oral sepsis, and are aided in many cases by the habit of chewing a mixture of tobacco and lime in which the prisoners indulge in their homes. Moreover, the view that accumulation of tartar on the teeth is closely connected with oral sepsis is strongly supported by the fact that in 1,083 prisoners examined during the period under consideration, tartar was found on the teeth of 590 or 54.47 per cent, while of these 590, oral sepsis existed in 461, or 78.13 per cent.

It has already been shewn that the preliminary examination revealed the fact that 38.11 per cent of the prisoners confined in the jail suffered from oral sepsis, and the following table shews the marked prevalence of this condition among the prisoners admitted during the subsequent twelve months —

From 1st March 1904 to 28th Feb 1905	No of prisoners admitted into jail	No with oral sepsis	Percentage with oral sepsis
In bad health	229	181	79.03
In indifferent health	631	474	75.11
In good health	1,301	655	50.34
Total	2,161	1,310	60.64

An outside enquiry, for purpose of comparison was also instituted among the patients attending the Midnapore Sadai Dispensary for a month as well as among the paid warders of the jail and in the police whose lines are close to the prison. The following were the results obtained —

	No of persons examined	No with oral sepsis	Percentage with oral sepsis
Patients attending the dispensary	680	280	42.50
Warders	57	25	43.80
Police	55	30	54.50
Total	792	344	43.40

These figures may fairly be taken as shewing that oral sepsis is a common affection among the free population of the Midnapore District, in which it has already been shewn that dysentery and diarrhoea are rare, while in the jail it is found that the greater prevalence of these diseases is accompanied by a larger proportion of oral sepsis.

The preponderance of oral sepsis among the cases of dysentery and diarrhoea in the jail hospital is shewn in the following table —

From 1st March 1904 to 28th Feb 1905	No	No with oral sepsis	Percentage with oral sepsis
Admitted into hospital for dysentery	209	147	70.33
Admitted into hospital for diarrhoea	52	40	76.92
Died of dysentery	9	8	88.80

During the twelve months under consideration, an examination was made of 680 convicts in order to ascertain how far their tongues were indicative of digestive disorders, and note was taken only of those in whom the appearance of the tongue was characteristic of gastric or intestinal derangement. The tongues were found to be thus affected in 57, or 8.38 per cent of the 680 prisoners examined, but of these 57 no less than 50 or 87.7 per cent suffered from oral sepsis. It was also noticed that with the advent of the cold weather many of the prisoners developed a superficial inflammatory condition of the tongue, lips and mucous membrane of the mouth generally, and the majority of these cases were already suffering from oral sepsis.

The foregoing facts, in my opinion, point directly to the conclusion that oral sepsis is not only closely associated with disorders of the digestive tract, but is an important factor in the dysentery and diarrhoea which prevail in the Midnapore Central Jail. The long continued ingestion of the pyogenic organisms and then

products accompanying oral sepsis must obviously undermine the power of resistance of the intestinal tract, to say nothing of the general health, and it is not difficult to conceive that the bowel thereby becomes not only more susceptible to a disease like dysentery, but when once the latter is established, is in further danger of a septic infection being implanted on the specific ulceration. Dr Hunter * holds that disastrous results from typhoid ulcers are seldom produced unless the ulcer shows evidence of prior infection with other than the specific bacilli. This view is extremely suggestive with regard to dysenteric ulceration, and it is noteworthy that among a total of 2,689 admissions into the jail hospital for dysentery during the past twelve years in only one case can any record be discovered of abscess of the liver in connection with this disease—a fact which points to the conclusion that the dysentery here is bacillary rather than amœbic in origin.

That oral sepsis is detrimental to the general health of the prisoners is evidenced by the fact that 76.16 per cent of those in bad and indifferent health on admission into jail suffered from this affection, as compared with 50.34 per cent of those admitted in good health, while the same condition was also found in 19 out of 26 deaths from all causes, a percentage of 73.07.

Though it is outside the actual scope of this paper, a brief reference to the prevalence of oral sepsis in respiratory diseases is not inappropriate. The following are the figures obtained in the jail —

From 1st March 1904 to 28th Feb 1905	No admitted into hospital	No with oral sepsis	Percentage with oral sepsis
For bronchitis	27	19	70.37
For pneumonia	11	10	90.90
For tubercle of the lungs	23	22	95.65
Total	61	51	83.60

These figures are instructive as being confirmatory of the general deleterious effects of this condition, and the preponderance of the affection in disease of the alimentary and respiratory tracts, both of which are so intimately connected with the mouth, is very striking.

The table below contrasts the details of admissions and deaths in the Jail Hospital from dysentery and diarrhoea, respectively, and also the daily average strength of jail population, for the twelve months during which oral sepsis was

specially investigated and treated with the previous eleven years —

Midnapore Central Jail Hospital	Admissions	Deaths	Case mortality per cent	Mortality per mille of daily average strength of jail population	Daily average strength of jail population
From 1st March 1904 to 28th Feb 1905 *	Dysentery 209 Diarrhoea 52	9 Nil	4.30 Nil	9.65 Nil	932.50
1903	Dysentery 341 Diarrhoea 63	12 5	3.41 7.81	12.47 5.19	961.67
Average of 5 years, 1898 to 1902 †	Dysentery 207.80 Diarrhoea 69.40	15.80 2.20	7.58 3.17	15.16 2.11	1042.06
Average of 5 years, 1893 to 1897	Dysentery 222.00 Diarrhoea 111.60	13.00 1.40	5.80 1.25	14.98 1.61	868.59

These figures afford further evidence of the relation between oral sepsis and dysentery and diarrhoea, inasmuch as they show the value of local treatment of the mouth in combating these disorders. Though it would appear from the vital statistics of the district that dysentery and diarrhoea were less prevalent in 1904 than in previous years, all the figures obtainable from the Midnapore police hospital show that admissions for dysentery were more numerous during the twelve months already referred to thus —

Midnapore Police Hospital.	Admissions	Deaths
From 1st March 1904 to 28th Feb 1905 ‡	Dysentery 71 Diarrhoea 5	Nil Nil
1903	Dysentery 46 Diarrhoea 23	Nil Nil
Average of 4 years, 1899 to 1902	Dysentery 50.75 Diarrhoea 11.50	1.50 0.25

The prevalence of oral sepsis among the police has already been pointed out, and it is obvious that systematic treatment of this condition could not be carried out among them in the same way as was possible among the prisoners in the jail. The prevention of bowel-complaints has long engaged the attention of the jail authorities, and none of the numerous prophylactic measures introduced by them in previous

* In January and February 1904, there were 26 admissions with 1 death from dysentery, and 5 admissions with no death, from diarrhoea, as compared with 36 admissions and 3 deaths, and 10 admissions with no death from these diseases respectively in January and February 1905. In 1904 the case mortality from dysentery was 3.18%, the mortality per 1000 from the same cause 7.44, and the daily average strength 940.11.

† There was no death returned as from dysentery in 1898.
‡ In January and February 1904, there were 4 admissions for dysentery and 3 for diarrhoea without any deaths from either disease, as compared with 3 admissions and 1 admission for these diseases respectively also without any deaths in January and February 1905.

years were relaxed during the period under consideration. Nor are any recent alterations or possible improvements in the diet or general surroundings of the prisoners, sufficient to be altogether responsible for the diminution in these disorders, and it therefore seems reasonable to conclude that the systematic care of the prisoners' mouths has been largely answerable for the decrease in the sickness and mortality from these diseases in the jail during this period.

The treatment of oral sepsis among the prisoners has been directed towards establishing a healthy condition of their mouths as soon as possible. For this purpose the result of the systematic examination already described is recorded on their tickets as well as in the admission-register, and all prisoners found to be affected are given a distinguishing mark, a red S on their caps. Tooth powder consisting of one part of desiccated alum and seven parts of charcoal, and toothsticks are issued throughout the jail, and all the prisoners are made to clean their teeth daily. Special attention is paid to the state of the teeth and gums which are frequently examined, and accumulations of tartar are removed by scaling. Ulceration and suppuration of the gums are treated by the free local application of liquor iodi fortis (B. P.), which has been found to be much more efficacious than nitrate of silver, chloride of zinc or any other caustics. Indeed I have been struck with the great local and general improvement that has followed the application of iodine in several cases of bad dysentery complicated with marked oral sepsis. Alkaline astringent and antiseptic mouth washes are also employed. In cases where the teeth are much loosened by retraction of the gums, they are extracted. It usually happens that under these circumstances the teeth are thickly coated with tartar and the gums ulcerated and suppurating, and in these cases it has been found that a useful working basis on which to determine whether the teeth should be extracted or preserved is the possibility of removing them easily with the unaided fingers. If this cannot be done, the teeth should generally be allowed to remain and in most cases with scaling and careful treatment of the gums, a marked improvement ensues, and the teeth become comparatively fixed again. If, however, the teeth are so loose that they can without difficulty be pulled out with the fingers, it is better to remove them. The above remarks obviously do not apply to such conditions as are met with in dental caries, suppurating stumps, alveolar abscess and the like, these receive their appropriate treatment. It is hardly necessary to add that all hygienic and dietetic precautions for the prevention of bowel diseases are combined with the special treatment of oral sepsis.

I have had neither the leisure nor the requisite facilities for approaching this question of oral sepsis and its relation to dysentery from a

bacteriological stand point, and I have brought the subject forward in the hope that others may take up the matter from that as well as from the clinical aspect. The subject is, I think, an important one which well merits further investigation, and it is perhaps possible that more extended enquiries may show that many of the severer types of dysentery are due to direct septic infection from the mouth.

My thanks are due to Civil Hospital Assistant Dakshina Pada Bhattacharjee of the Madras Central Jail for much assistance in conducting this investigation and for collating the evidence on which the conclusions are based.

THE ETIOLOGY OF DYSENTERY WITH SOME NOTES ON TREATMENT

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CAPTAIN, I.M.S.

(10th D. C. O. *Lancet*.)

DYSENTERY is generally classified under two headings —

1. *Bacillary*, usually acute, and caused by the bacillus dysenteriae, of which there are several closely allied strains, and the best known of which is the bacillus dysenteriae of Shiga.

2. *Amoebic* generally chronic, and associated with the presence of the amoeba dysenteriae, by many observers claimed to be the causative agent, but, as I shall endeavour to show without sufficient foundation.

ETIOLOGY

A — General Conditions

(1) *Infection* — There are many instances in the literature of troops contracting the disease from occupying ground on which previous epidemics have occurred, while others on adjacent ground were free, proving the infective nature of the disease, and that the causative agent is often in the soil, marshy and foul ground being especially favourable.

(2) *Contagion* — Many writers have brought forward proofs of this, a notable instance being the case of men in a French hospital in beds adjacent to patients invalided for dysentery in the last China War, contracting the disease, there being no possibility of their having contracted it in any other way, and Professor Dopter at the Société Médicale des Hôpitaux de Paris, October 28th, 1904, quoted a similar instance.

It is probably due to contagion that the spread of dysentery is so rapid at times in armies in the field, where the virus is usually especially virulent, and the men are crowded together, their resisting power at the same time being often weakened by privations and fatigue.

In most tropical and sub-tropical countries, however, the disease is endemic, and the cases that occur in Indian cantonments are usually sporadic.

B—Disposing causes

(1) *Intestinal Catarrh*—This is a most potent factor in the production of the disease. There is no doubt that in ordinary health the infective agents of dysentery, as of many other diseases pass through the intestine without producing any effect, but when the vitality of the intestinal tissues is lowered by catarrh the disease asserts itself.

This catarrh is produced in a variety of ways, chills, excess in food and alcohol, ingestion of unripe or more especially overripe fruits, and tainted or badly cooked food. Chronic constipation is an important cause, the large intestine being overloaded and so weakened in the very place for which the causative agent in dysentery has a selective affinity.

(2) All bad hygienic conditions, starving, exposure to wet and cold, overcrowding.

(3) *Age and sex* seem to have no other influence than that resulting from the greater exposure incident to the life of the male adult, it is, however, most fatal in children and least fatal in women.

Taking an average year 1902 the figures are—

	Admission per 1,000 of strength	Death per 1,000 of strength
European troops	20.4	69
Children „ „	18.3	191
Women „ „	17.2	39

(4) *Race*—In India natives suffer from it very much more than Europeans, but it is not nearly so fatal.

1891—1900	Admission per 1,000 of strength	Death per 1,000 of strength
Native troops	48.8	59
European troops	29.6	87

(5) *Season*—The maximum is usually towards the end of the rains, but in Bombay it is in December.

(6) *Temperature*—A warm moist temperature favours it, Bengal showing the greatest prevalence and the Punjab the least.

In 1902 the admissions per 1,000 for British troops were Bengal, 26.1, Punjab, 13.9.

(7) *Altitude*—In India it is a disease of the plains, the admission rate showing a most marked decrease as the height above sea-level increases. In 1837 the admission at stations less than 100 feet above sea-level was 41.9, under 500 feet 32.5, 3,000 feet to 8,000 feet 18.7, above 8,000 feet 3.8 per 1,000, but this reduction is directly dependent on the approximation of the temperature to that of temperate latitudes.

(8) *Acclimatisation*—There appears to be none for this disease, usually amongst Europeans for the first year of residence, the liability is very great, but for the next four or five it falls very low, after that period continuing to increase.

(9) *Relation to malaria*—Although it has been suggested that there is a relationship between the two diseases and Craig in his book on æstivo-autumnal fevers advocates the view

that the plasmodium malarie is a causative factor in dysentery, there is every reason to believe that the two diseases are quite distinct, there being many places in which dysentery is prevalent where malaria is unknown the opposite also applies, of which Peshawar is an example, malaria being common and often virulent, while dysentery is rare and generally mild.

Manson and others describe a form of pernicious malaria characterised by acute dysenteric symptoms, but the high fever, amenability to quinine and a blood examination will make the diagnosis certain.

At the same time it is possible to have a double infection in which case the dysenteric symptoms usually subside during the exacerbations of the malaria.

C—Mode of conveyance

Apart from epidemics in which contagion would seem to play the most important rôle, the infective agent in the ordinary endemic form must be taken into the mouth, and this may be accomplished by means of water, food and air.

It is mainly a water borne disease, and drinking water infected from the excreta of dysenterics is the most usual channel, at the same time Major W. J. Buchanan, R.M.S., has shown that the provision of a pure water-supply does not by any means necessarily eradicate the disease in institutions.

Food may also be infected by means of dust and flies, and it can readily be seen how dangerous are uncooked foods as salads, growing as they do so close to the ground in manured earth.

With regard to aerial infection an outbreak of dysentery in the 1st Bombay Grenadiers at Aden in 1902 was ascribed as largely due to the swallowing of dust contaminated with dried faeces from polluted ground.

BACTERIOLOGY

In reviewing the literature on this branch of the subject, one is struck by the marked difference in the results obtained in bacillary and amoebic dysentery respectively, in the former case on the one hand, the proofs are positive and convincing that this form of dysentery is caused by a group of very closely allied bacilli, of which the type is the one originally described by Shiga in Japan, the chief point of difference among the members of the group or strain being one of agglutinating power, on the other hand, most conflicting and disappointing evidence is produced as to the amoeba dysenteriae being the causative agent in so-called amoebic dysentery, and this uncertainty extends to the descriptions of the symptoms, pathology and treatment. I am not concerned with these, so one instance will suffice, Rogers says the cæcum and ascending

colon are the parts of the intestine usually affected, and the sigmoid and rectum seldom, Strong and Craig say exactly the opposite, Tuttle says the sigmoid and rectum are sooner or later always affected, Shiga says the lesion is generally in the rectum on descending colon, and Flexner simply says the colon is affected without specifying any particular part of it.

Bacillary Dysentery—The bacillus was first described by Shiga in 1898, by some thought to be identical with that described by Chantelesse and Vidal in 1888, and this was quickly confirmed by Flexner and Strong in Manila, Kruse in Germany, Rogers in Calcutta, and many others.

It is a short rod with rounded ends of the type of the *b. coli communis* and *b. typhosus* and intermediate between the two in motility. It does not form spores, and agglutinates with the serum of dysenteries only.

Nature of the infection—The bacillus is found in the intestinal walls and sometimes in the mesenteric glands, it is not found in the spleen nor in other internal organs, nor in urine, blood, or milk, hence it is a toxæmia, unlike typhoid which is a septicæmia, and this is proved by the fact that the characteristic pathological changes can be produced equally with living and dead cultures.

Evidence in favour of the causative agency of the bacillus dysenteriae, Shiga originally showed that—

1 It is always found in patients suffering from this disease, but never in healthy persons nor in those suffering from other diseases.

2 It can be cultivated outside the body, and pure cultures administered to healthy animals produce the disease, and the bacillus can be recovered from them.

3 The serum of patients suffering from dysentery agglutinates cultures of the bacillus, the serum of healthy persons and of those suffering from other diseases having no such effect.

4 Shiga has prepared a serum which, when injected into persons suffering from dysentery has had marked curative effects, the mortality being reduced from 25–55% to 8–12%.

These statements have been confirmed by Flexner, Kruse, Rogers and others, and lately in a large series of experiments by Lieutenant-Colonel Firth, R.A.M.C. Recently, too, Duval and Bassett have isolated the same bacillus from stools in the summer diarrhoea of infants.

The following two cases in human beings are also very convincing, Strong reports the case of a condemned Filipino who swallowed some of a culture and contracted the disease, and Flexner reports that his assistant whilst working with a pure culture received from Manila, and in a place where dysentery was unknown, accidentally swallowed some of it from a pipette, and in spite of promptly using antiseptic mouth-washes contracted the disease.

The further study of this bacillus has led to the discovery that slight cultural and agglutinating differences occur, also that the protective power *in vivo* of antidyenteric serum is almost twice as much for cases due to the same type as for those of the "crossed" type.

Colonel Firth also shows that, besides the pathogenic bacilli, others are found in the excreta of dysentery cases which apparently are not pathogenic, though presenting some superficial cultural resemblances. The distinctive features seem to be their ability to split maltose, mannite, and galactose, to the formation of an acid without the production of gas, and to the production of indol, characteristics which are wanting in the pathogenic varieties.

The proofs then as to the causative agency of the bacillus dysenteriae, representing a group of closely allied members, is positive and convincing.

The case for the amoeba dysenteriae on the other hand is very different.

1 Points in favour of its causative agency.

(a) It is found in most cases in the stools and intestinal walls.

(b) Musgrave and Clegg deny one of the arguments against it that it is commonly found in the normal intestine, they state that probably all amoebae are pathogenic, and that the appearance of amoebae in the normal intestine is a much rarer occurrence than is generally believed, that their persistence in this location without the production of lesions for a time greater than the known latency of some cases of infection (five months) has not been shown, and that the appearance of amoebae in the stools warrants therapeutic measures regardless of the nature of the clinical symptoms.

(c) Rectal infections containing amoebae produced dysentery in cats.

(d) Musgrave and Clegg were only able to grow the amoeba outside the body in presence of some symbiotic bacteria, but grown with the cholera vibrio it produced the disease when given to monkeys, the cholera vibrio not affecting these animals.

(e) Futehei reports that the blood serum of nearly all the cases admitted into the John Hopkin's Hospital with this disease for the past two years has been tested for agglutination with negative results, and Rogers has reported similar results in Calcutta.

(f) The close association between this disease and liver abscess is said to be well marked, the amoeba being found in the pus and walls of the abscess which is otherwise often sterile.

2 The points against this assumption are

(a) The presence of the amoeba in the intestine proves nothing, as it is often found after a dose of Calabar Salts.

(b) A very large number of observers have stated that they have found amoebae in the stools of healthy individuals.

(c) Rectal injections of distilled water have produced dysentery in cats

(d) A strong argument against it is the fact that the amoeba from these cases cannot be grown in pure culture outside the body. It shows, moreover, a special affinity for the *b. coli* group to which the *b. dysenteriae* belongs, and it seems much more probable that it is only a concomitant of this organism, possibly having a secondary action on the ulcers later in the disease, burrowing into the tissues as they are very large and very strong.

Moreover, Musgrave and Clegg were able to produce the disease in monkeys by means of the amoeba taken from ordinary stagnant water, and this is contrary to the behaviour of all infusoria, as free living organisms are not likely to become parasitic, they are generally destroyed and never become pathogenic.

The amoeba in the faeces is killed at about 120° F, which is also unlike the behaviour of a pathogenic organism.

(e) Flexner has shown that the bacillus dysenteriae is increasingly difficult to find in the more chronic stages of bacillary dysentery, and, although no observer has reported on this, it may be that the agglutinating action of the serum of patients with chronic bacillary dysentery also declines and eventually disappears.

(f) In connection with liver abscess a great point has been made of the fact that the pus is often sterile, but it is no proof that the *b. dysenteriae* is not the original cause and that it then dies out, for similar abscesses occur in connection with typhoid and other acute infectious diseases. In this case the amoeba may have some secondary destructive effect as in the intestinal ulcer.

Moreover, the amoeba is far from universally present in these abscesses, and in some cases no intestinal lesion is found either. For in Government of India Sanitary Reports for 1900, amongst European troops, of 86 post-mortems only 46 were associated with ulceration of the intestine.

In the five year period 1896—1900 53% had ulceration, and of these 28% only had a single abscess, but where the abscesses were unassociated with ulceration 44% had a single abscess.

Of a total of 161 single abscesses 41% were associated with ulceration, and of 292 multiple abscesses 59%.

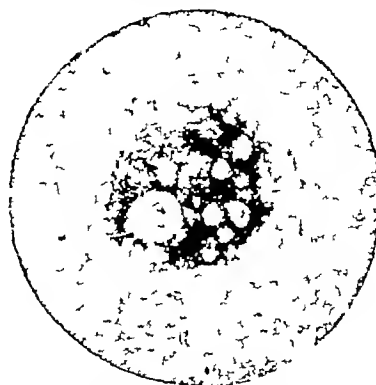
The report also states that the ulceration leading to liver abscess may be of any kind, and that when there is no ulceration there is a greater chance of the abscess being single.

Again in the South African War out of a total of over 26,000 cases of dysentery liver abscess was almost unknown, so that this complication would seem to be due to climatic conditions.

Conclusion—The proof then of the bacillus dysenteriae being the pathogenic cause of dysentery is well established, and taking all the evi-

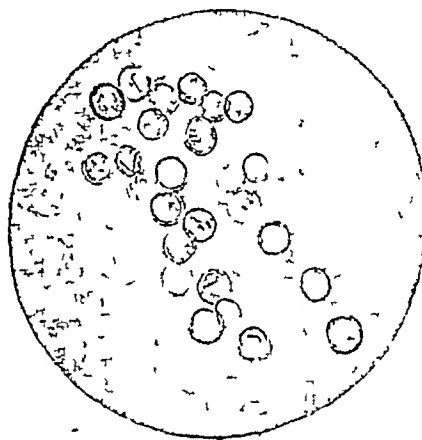
dence with regard to the amoeba, its action is definite both in the intestinal lesions and in the liver abscesses, but secondary to the action of the bacillus dysenteriae.

The figures of amoebae are taken from Musgrave and Clegg's report—

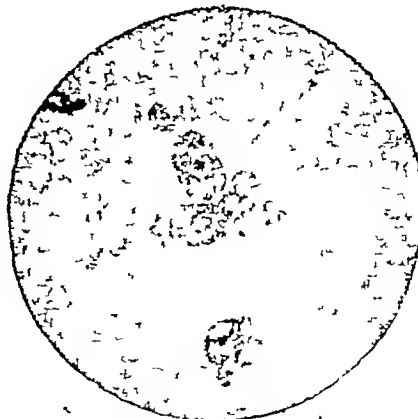


No 1—Photo-micrograph of cover-glass impression from a 24-hour old plate culture (stained with Romanowsky)

The contractile vacuole contains a bacillus



No 2—Encysted forms. These, when ingested, rapidly multiply by fission and show great activity



No 3—Unstained sterile water emulsion of amoeba

Some Notes on Treatment by Geranium

The geranium which is a plant indigenous to South Africa is well known to the natives of that country, who use it as a specific in dysentery, simply chewing the dried root.

I was induced to give this drug a trial after seeing some strong recommendations of it from South Africa

The method I employ is to take the roots and lowest trunks of the ordinary garden geranium, *Pelargonium Zonale*, or any of its varieties, and, after washing them and drying in the sun, $\frac{1}{4}$ lb is taken and boiled in a pint of milk for one hour, adding milk from time to time and making the whole up to a full pint at the end of the hour. This infusion is then strained through fine muslin and two ounces are given every two hours until the disease is cured, which is usually in from two to six days.

In some cases a persistent diarrhoea remains after blood and mucus disappear, this usually yields readily to a mixture of bismuth salicylate, salol, and pulv ipecac co.

This drug is included in the United States Dispensatory, obtained from the *geranium maculatum*, which belongs to the same natural order (*Geraniaceae*) as *Pelargonium Zonale*, but to a different tribe. Its preparations include a powder, decoction, tincture and extract, and it is described as a valuable astringent in diarrhoea and dysentery.

It has been analysed by Trimble and Peacock, who found that the dry drug contained from 9.72 to 27.85% of tannin according to the time of year when it was gathered, and found that the tannin belonged to the class analogous to gallo-tannic acid, yielding pyro-gallol on heating. They decomposed it by the action of HCl into gallic acid, glucose, and geranium red.

Tannic and gallic acids are probably the sole active ingredients.

Treatment by this drug has several advantages —

(1) In most cases, if not prolonged beyond five or six days, it is not necessary to give any other food, the dosage used giving the patient $1\frac{1}{4}$ pints of milk daily.

(2) It is not nauseating like many drugs used for this complaint, it has a sweetish rather pleasant taste, and as a rule quickly relieves the nausea and pain in the abdomen.

(3) It is not lowering to the patient as the treatment with salines sometimes is.

(4) Its action seems to be entirely specific. I can speak from personal experience as to its efficacy, as I had a sharp attack of dysentery in 1901, and after starting treatment with magnesium sulphate without benefit, I was able to get some geranium which cured me in four days, taking nothing but the infusion and occasionally a little ice.

All the cases treated were of the bacillary type, and occurred in Europeans and Natives. They were entirely unselected, every case of dysentery being treated by this method while the geranium was available.

I have not thought it worth while to publish the figures as at present the total number of cases is under 50, but the results are very

encouraging and convince me that it is a valuable addition to the somewhat unsatisfactory list of drugs so far advocated.

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DYSENTERY ITS VARIETIES AND CAUSES, SUMMARISED AND CRITICISED WITH A NOTE ON TREATMENT AND PREVENTION

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Varieties 1 Catarrhal—Due to hyperæmia of the chylipoietic viscera, result of some irritation—dietetic, chemical, bacterial and parasitic. Imperfectly cooked *dhal* or oats is a common cause of this variety among the natives of India.

2 Acute, specific or bacillary Caused by a bacillus which agglutinates with the blood of patients suffering from this disease.

3 Amœbic Result of a parasitic amœba.

4 Spullai

5 Mixed

6 Chronic

Any of these may degenerate into a chronic disease. Of these the most liable to do so is the amœbic, though this may possibly be due to its liability to cause abscess in the liver and thereby undermine the patient's chance of throwing off the primary disease. In any of the chronic forms an hyperæmia or atrophy of the liver may occur.

It is open to opinion whether the summer diarrhoea of children is not a true Shiga dysentery, and also whether the amœbic dysentery is also not a true Shiga dysentery in which the amœba has, by such affection, been given other powers, though normally harmless with a healthy intact intestinal mucous membrane. It seems hardly reasonable that we should have such a specific infection in adults and in children, and yet in infants such should be considered as a separate disease. It may yet be found that the summer diarrhoea of children, or cholera infantum, is nothing but a true Shiga

dysentery in infants. It is possible that the bacillus of Shiga in the temperate zone may have its virulence modified. From a clinical point of view all cases of dysentery may be divided into acute or chronic. In actual cause it would seem possible, and even probable, that all cases are referable to the bacillus dysenteriae. At the present moment, however, most are agreed that such at any rate are either the result of B dysenteriae of Shiga or amoebic dysentery. With reference to the B dysenteriae there has been recognised two distinct types of it, viz, the alkali producing or Shiga's bacillus, and an acid producing or Flexner's bacillus. The term bacillary dysentery in this respect is generic since the disease may be caused by one or either of these types of closely related organisms.

ACUTE OR BACILLARY DYSENTERY (OR ASYLUM DYSENTERY)

- 1 Acute disease—rapid onset and rapid course
- 2 Cure or death usually within a month
- 3 Stools neutral or acid
- 4 No abscess of liver
- 5 The ulcerations of the bowel expansive but always superficial and never reach the muscular coat*

6 In order to detect bacillus dysenteriae it seems essential that the stools *must* be examined fresh as early as possible, otherwise the stools become so overcrowded with B coli and other intestinal saprophytes that their isolation is rendered difficult.

AMOEBCIC DYSENTERY

- 1 Tendency to chronicity from outset
- 2 Alkaline stools and presence of amoeba and bacilli and even spirillae
- 3 Irregular course with remissions and exacerbations
- 4 Complicated with hepatic abscess

SPIRILLAR DYSENTERY

It is said there is no increase in the temperature in this form which at once distinguishes it from the bacillary type (Dautic *La Caducee*, 17th December 1904). The same authority, in the same place, says, that the liver is not affected, even though the disease becomes chronic, thereby distinguishing it from the amoebic variety. To establish diagnosis a piece of mucous membrane from the stools is placed on a slide. A grey central part is seen surrounded by a white of egg margin. It is teased out, stained and washed with water, cultures on agar develop bacilli not stained by Gram.

MIXED DYSENTERY

This is probably of much more frequent occurrence than supposed and may have been the cause of doubts as to the origin of tropical abscess from merely the amoebic variety. Mixed

dysentery, therefore, might from its nature prove very intractable and may take on periodical exacerbations of different types according to the conditions being suitable for development of the bacillus dysenteriae or the amoeba. That is to say, one or other of these may remain quiescent in the intestinal walls and may give rise to a recurrence of the disease, but of a different origin. It is possible that with this view all chronic dysentery is a mixed infection, at one time bacillary and at another amoebic. This would open up the question whether any of the varieties of dysentery may be chronic, and whether all dysentery is not to be regarded as an acute infection reaching its severest variety in the bacillary. Investigation into this point would probably lead to the opinion which at present, I take it, most will be inclined to hold, viz, that any of the varieties may become chronic.

TREATMENT

Preventive 1—Prohibition of all food exposed to water pollution—lettuce, etc., and unripe foods, also of any other food which is liable in the individual to set up intestinal catarrh.

2 Hygienic sites of habitations and drainage of all soil around.

3 Sterilisation of water or disinfection of wells.

4 Disinfection of excreta and the sanitary disposal of such. Natives are rendered more prone to the disease by the close relation of their bodies to moist soil (counting chill) polluted with various excreta. To this is added the infection of food by flies and other insects from the infective soil, not only this, but the habits of the natives washing themselves after defecation in a perfunctory manner renders infection of their food by means of infected nails probable, tending to spread infection to others and to reinfection.

5 All excreta from any case should be disinfected with 5 per cent carbolic and all soiled linen boiled in such. Bedsteads, blankets, should be well aired.

6 The maintenance of health by hygienic living, especially thorough ventilation of living rooms. Dampness of rooms will not exercise a very prejudicial effect if there is thorough ventilation.

7 Avoidance of chills. The avoidance of a chill is of special import since the arrest of the production of the natural intestinal antiseptic—the bile—would predispose to an attack.

GENERAL MANAGEMENT OF A CASE

- 1 Attend to hygiene of rooms
- 2 Attend to hygiene of patient

DIET IN DYSENTERY

Dietary very important. In early stage milk, raw beef juice, eggs, barley-water, rice-water, oatmeal-water, later on gelatine or jellies and

* (In confirmation of this vide J. W. Eyre, *B M J*, April 30, 1904)

beef teas, and in convalescence farinaceous foods

I do not believe that a too rigid adherence to one particular article of diet is judicious treatment, but I do believe that a dysentery patient requires as much care exercised over his diet as a typhoid patient

Medicinal—In a large number of cases of catarrhal dysentery in children and adults, of varying degree, mag sulph in concentrated solution and given in doses of 3i to ʒss, according to age, severity and robustness of patient, has cured the affection in my hands. In a Government School, where a large number of cases of dysentery occurred among children, every case was treated by mag sulph or castor oil, according to severity and age, with success. It is probable, I think, that because mag sulph not only empties the gut of the effete matter and bacilli with the watery stool it produces, but also starts the flow of bile and maintains an antiseptic action of the bowel, that it produces such good results when not given too late

If the other forms are met early it is my opinion that early similar treatment will have favourable results. In fact, it is open to opinion whether cases of catarrhal dysentery thus cured may not have been the earlier stages of one of the other varieties. In younger and weakly children repeated doses of castor oil is extremely useful. Olive oil 30 cc thrice daily has been given with success increased to 60 cc and 90 cc (*Rutherford, American Medicine*, 12th March, 1904)

Ipecacuanha is useful in acute cases. In some chronic cases it is of doubtful efficacy but should be given if tolerated

Locally

For temperature—Cold sponging with vinegar, or alcohol, or eau-de-Cologne. *Internally*—Salol

Anal region—Externally Should be washed with some disinfectant. *Internally*—If considered necessary pot permanganate or other antiseptic injections. Normal salt solution useful. A cocaine suppository may be necessary prior to the injection

Tenesmus if severe—Tannic acid and cocaine aa 4 per cent combined with hot fomentations. May add few drops of landanum to the enemata if used

Stimulants—Frequently necessary in severe forms or in weak people. Brandy I consider the best stimulant for such

Hæmorrhage—Ergot or adrenalin added to the enemata

Internally—Bismuth salicylate combined with Pulv Kino Co and Pulv Cinnamon Co. In solution, Ergot, Tr Hamamelidis, etc

SERUM TREATMENT

That there seems a field for good results from such the following confirms V G Korotchenski in his report on dysentery among the Russian

troops in Manchuria gives details of the treatment of the disease by Shiga's and Gabritchevsky's serum. In all 70 cases were treated by doses of from 20 cc to 110 cc at one injection. In mild cases 20 cc of the serum proved sufficient to check the disease, in severe cases 60 cc were necessary, and in very severe cases 100 cc repeated when required were administered. In advanced and neglected cases the serum proved useless, but when given early, the treatment seemed more effective than any other mode of treatment. In no case treated by this serum did a relapse occur, nor did acute dysentery become chronic. No other form of treatment was followed until the evacuations became fecal, when irrigation of the bowel by potassium permanganate, and bismuth or salol by the mouth, were at times employed

After treatment—Hommel's Hæmatogen, maltine, careful dieting combined with a sea voyage. A case should not be sent for a sea voyage too soon as owing to change of diet and mode of cooking relapse may follow

PUBLIC HEALTH MEASURES

Dysentery must be regarded as an acute specific infectious disease like typhoid deserving sanitary measures for its mitigation and spread among any given population. Its cause a bacillus, or a bacillus plus an amoeba, gives us a clue to the measures to be adopted, if the life history of these organisms is thoroughly understood. But though our knowledge is not as complete as we should like, still the importance of the preservation of the public health predestine the least available knowledge to be utilised for a maximum effect. And so, what little we do know should be made use of for the adoption of a sanitary campaign against the disease. The fact that a given water-supply has given rise to cases of dysentery, and the detection of amoeba therein, shows a water-supply may be one of the sources for the spread of the disease. In this respect it is probably more frequent with well water, and more frequent when either well or reservoir water is at its lowest. This was certainly the case with the reservoir which supplied water to the school in question. Each year when before the rains the water-supply ran low in the reservoir cases of dysentery occurred. Consequently steps should be taken that the water-supply be above suspicion, and at the worst or dry times of the year it should certainly be boiled. By all means have it filtered through a reliable filter, but it must be understood that this must be cleaned under supervision. On the other hand numerous cases of dysentery occur (and I believe the disease is unfortunately common among troops at Barrack-pore Barracks), where the water-supply is both pure and under supervision. There can be no doubt that there are other means of its spread than through the medium of water. Natives with dysentery defecating in or around their

houses or shops form a dangerous class of individuals, since the settling of flies and other insect on such deposits cannot but spread the disease to food, milk, water, etc. Frequently it is impossible to trace the origin of a number of cases except through some such explanation. Again, the influence of winds in spreading the bacilli from inspissated faecal deposits to food and water must also be remembered. Herein there comes to be a fruitful source of the spread of the disease and one which requires adequate measures for the suppression of it by the screening of all food. In this connection, too, must be joined the relationship of dampness of soil to the furtherance of the development of the bacilli in the infected deposits. Thus it becomes important to ensure efficient drainage in and around every native hut, preferably erected on the concrete, the erection of sanitary latrines, and the maintenance of them in a sanitary condition and the absolute prevention of defecation except in latrines or other sanitary appliances in any town or village. These matters should be under the control of an independent sanitary inspector. All cases of dysentery, except the mildest, should be encouraged to go into hospital, not only for treatment, but for proper nursing and the greater care of the proper disinfection of the discharges. Segregation is not advocated in the true sense of the term, but isolation in order that infective discharges may be thoroughly treated to allay the chances of an epidemic. If, however, where cases can be well treated at home and reliable persons can be employed to ensure the thorough disinfection of discharges there can be no exception taken to this course. Lastly, the importance of the efficient ventilation of living rooms cannot be overestimated, not only for the maintenance of good health to overcome disease, but also to counteract dampness so common with the living rooms of the poor classes in India. With the movement of a force into an imperfectly known district, medical officers should be sent with the advance scouts to examine the water-supply and the prevalent diseases.

THE USE OF IZAL IN DYSENTERY

BY F. PERCIVAL MACKIE, FRCS (ENG),

LIEUT. R.N.S.

ON this subject the appearance of an interesting and convincing paper by Major J. C. S. Vaughan, in the October number of the *Indian Medical Gazette*, prompts me to write a short résumé of my experiences in the same line.

[The loss of my case records during my travels in Sikkim prevents me from placing my results in statistical form. I can therefore only speak in general terms.]

The most of my cases occurred when I was medical officer to an English County Asylum, in 1898, some refer to soldiers in India.

The relation between asylum dysentery and various forms of the disease occurring in the tropics has not been as yet determined.

In my experience the two diseases are clinically indistinguishable, and their gross anatomical results are likewise similar.

They both react markedly to izal administration which is the main subject of this paper.

As to the actual causation of dysentery, every one agrees that there is a micro-organism at the bottom of it, but the number described as the cause grows larger almost daily.

With the evidence of Councilman, Laffey, Shiga, Ogata, Durham, Mott, Campbell and others, it is difficult to believe in the unity of dysentery, it seems much more likely that many different organisms may give rise to it under varying circumstances.

Clinically there are many types just as there are many degrees of inflammation of the colon. The two conditions are interdependent. Major Vaughan's three divisions are dependent on three well-defined anatomical conditions of the large gut, viz., catarrh, ulceration and gangrene.

In my series of about 65 cases there were eight deaths, and in all of the latter careful *post-mortem* examinations were made.

This seems a heavy mortality, and so it is, but the epidemics of dysentery in asylums are often very severe, and moreover during the early stages, when most deaths occurred, I was in process of throwing off the shackles of custom in the matter of treatment.

In all these eight cases the *post-mortem* appearances were so alike that to describe one is to describe all.

The morbid anatomy will be described in some detail, as on it the rationale of the treatment by rectal injections depends.

In every case the disease stopped short at the ileo-cæcal valve, in no case was the ileum involved. The morbid process was always most severe in the rectum and sigmoid flexure, and progressively diminished as one neared the cæcum.

In the earlier stages the mucous and submucous tissues were injected and felt thickened between the finger and thumb.

The surface was coated with shiny mucus of a tenacious character. The lymphatic follicles were swollen, pointing and often showed early ulceration when the surrounding membrane was only congested. This suggests that the disease primarily affects the solitary follicles.

In more severe places there were irregular patches of superficial ulceration, between which islands of healthy mucous membrane were apparent.

These ulcers were covered with mucus, and grey flakes of epithelium formed into a false membrane and mouths of capillaries plugged with clot were visible. There was great thickening of the whole gut, so that it felt like india-rubber between the fingers. This was so marked in chronic cases that on one occasion I was

able to stand a short cylinder of the gut upright on the *post-mortem* table without its collapsing.

Clinically one can generally feel the inflamed gut through the abdominal walls, first as a tender tumid swelling, but later it comes to feel like firm cold rolling under the fingers. In the gangrenous or fulminating cases there is extensive sloughing of the mucous membrane.

Sometimes the whole mucous membrane comes away in patches and was converted into grey-green or black gangrenous sloughs which stunk and beneath which free bleeding took place.

The membrane thus formed is composed of necrosed cell tissue, altered blood, fibrinous exudate and swarming bacilli and cocci. The ulcers rarely extend deeper than the submucous tissue, and so perforation is a very rare accident in dysentery, though it does occur.

The mesenteric lymphatic glands are generally swollen and congested and softened. In one case I saw central necrosis in a gland.

The microscopic appearances were as follows.

The mucous membrane was greatly thickened, the epithelial cells were heaped up, the top layers necrosed and lying as a false membrane. This membrane was composed of necrosed cells, fibrin and short bacilli (*B. coli*?) and cocci in short chains.

Blood was extravasated into the mucous membrane, and there was blocking of capillaries.

The changes in the submucous tissue were still more marked. This layer was many times its normal thickness.

The spaces were large, crammed, full of diapedesed red cells and in some places actual hæmorrhage. Enormous numbers of eosinophile pus, leucocytes (pus) were lying free in the spaces and considerable numbers of the other leucocytes. The same cocci and bacilli were prevalent, but mostly phagocytosed. The muscular coat was undergoing cloudy change and clogged with polymorphonuclear leucocytes. Reviewing the morbid anatomy, three points are noteworthy—

1 The disease is generally limited to the large intestine.

2 It appears to begin in the lymphatic follicles, and to extend afterwards into the surrounding tissues.

3 The ulceration extends superficially and does not tend to cause perforation.

From these facts three important clinical suggestions arise—

1 The disease being of the large intestine, it is most accessible locally, *i.e.*, per rectum.

2 The disease, if due to *local* causes (specific or otherwise), and not being systemic, should therefore be treated *locally*.

3 If local measures (rectal lavage and massage) are carried out, they may be performed without fear of perforation.

Treatment—When working in the Pathological Laboratory at St Bartholomew's Hospital in 1897, I watched some experiments by Mr.

Bruce Clark on the use of izal for surgical purposes.

The drug was little known then, but experiments shewed it to be a very valuable antiseptic, non-irritant, non-toxic and yet powerfully bactericidal.

Since then I have been in the habit of using it in many surgical conditions, finding it particularly useful in foul wounds, venereal sores, and as an injection in gonorrhoea.

In treating the epidemic of dysentery above-mentioned, I ran through the whole gamut of pharmacopœial astringents and antiseptics, as well as such things as the orthodox ipecacuanha, magnesium sulphate, salol bismuth β naphthol, tannalbin, but I only found benefit from the antiseptic coal-tar products. Izal was then tried by the mouth, in mixtures, in capsules (in half drachm doses), and with very good result.

Owing to the above-mentioned pathological considerations I began to give it by the rectum, and have had the best results from this method both in England and in India.

Mode of administration—A stout and medium-sized piece of rubber tube about three feet long affixed on to a plain glass funnel. Izal from one to two drachms in a pint of water at 100°–104° F. The foot of the bed to be raised. The india-rubber tube is attached at one end to the funnel and the other end greased and passed about four or five inches into the rectum. The patient lies on his back. About one to two pints of the solution may be run in to the large gut. In acute cases one pint is tolerated without pain. The funnel should not be raised more than about two feet. When the desired quantity has been admitted, the tube is withdrawn, and the patient instructed to retain the injection for 10 or 15 minutes. In irresponsible patients a finger should be kept on the anus.

Now the belly may be massaged. In this way the whole colon may be washed clear.

The splash and swash of the fluid can be felt and a wave be driven from one part of the gut to another.

After 10 or 15 minutes have expired, the bed-pan may be given, and the patient allowed to eject the enema. By the examination of the fluid an accurate idea as to the state of the ulcers may be obtained. The presence of blood, mucous flakes or sloughs will each tell something as to the condition of the gut, and suggest modification in the strength or character of the succeeding injections.

The treatment should be carried out twice daily in acute cases and once in sub-acute and chronic cases.

Remarks—The number of motions will rapidly fall after even two injections and will generally be reduced to two or three on the fifth or sixth day. The injections may be continued as long as blood and mucus are passed. When the gut is perfectly clean and the ulcers are healing, the

treatment may be stopped, but if the process of recovery is slow and the ulcers indolent, then injections of astringent solutions, *eg*, tinct sulphate, protogol or silver nitrate may be given.

In this way the various degrees of inflammation may be treated just as they occur elsewhere, as an ulcer on the tongue or on the skin.

Perhaps ipecacuanha may be administered in this way. I have never tried it.

The following advantages may be claimed for the rectal treatment of dysentery—

1 The rectal route is the nearest. The ileo-cæcal valve is 20 feet from the mouth and but five from the anus, and the whole of the disease is below the valve.

Why expend the virtues of the drug on 20 feet of healthy gut when it can be applied direct?

2 The effect of the drug on the disease may be gauged by the returned injection. The strength of the subsequent injections can be regulated on different drugs applied. The drug is not altered by contact with other juices, etc., before it can exert its influence, as it may be when given *per os*.

3 The temperature is lowered by the cleaning effect produced.

This is another factor as a proof of the local nature of dysentery. Cleaning away the products of decomposition lowers the temperature (due to local absorption of poison) exactly as uterine douching in puerperal sapæmia does.

4 In the acutest cases of dysentery there is often seen a condition of pinched coldness and collapse due to loss of blood and fluids from the tissues.

Hot rectal injections restore warmth and by absorption of water restore fluidity to the blood, and so relieve the heart. In other words, it acts as a saline injection.

5 A small advantage is that a nauseous drug need not be given by the mouth.

Even children tolerate rectal injections after they get over the first natural alarm.

In conclusion then I quite agree with Major Vaughan in his praise of izar as a cure for dysentery, but for the reasons mentioned I submit that it is more trustworthy, more rational, and I find more effectual when given in the form of colic lavage than when exposed to the unknown destinies of its journey in the small intestine.

THE DRUG TREATMENT OF DYSENTERY

By E. A. R. NEWMAN, M.D.,

Civil Surgeon, Hazaribagh

THE various drugs given in the disease would make a formidable list. They may be briefly classified as specifics, aperients, antiseptics and astringents. In the limits of a short paper it is impossible to consider all of them, and I do not propose to do more than discuss the action

of a few and indicate the line of treatment I have found give the best results.

APERIENTS—I may state at once my belief in the immediate and continued use of aperients in acute dysentery. Castor oil and opium given at the very commencement of an attack is frequently effectual, but is rather a cruel routine, I mention it therefore only to condemn it. Firstly it is frequently impossible in practice to treat a patient in the incipient stage, and later, or in a severe case it may do harm, by further irritating an already much inflamed bowel and aggravating the patient's sufferings.

SULPHATE OF SODA—The saline aperients, sulphate of soda or magnesia, answer the same purpose, and neither of the above objections apply to them.

The following is a useful routine formula—

R	Sodu Sulph	3i
	Acid Sulph Dil	m ʒ
	Aqua Chloroform	ad ʒi

Dose for an adult—Two tablespoonfuls to be taken at an interval of two hours for the first two doses and afterwards every four hours. Proportionate doses must be given to debilitated adults, females and children. The immediate relief after two or three doses is marked in many cases. Griping and tenesmus disappear, and the small frequent evacuations of blood-stained mucus, give place to occasional loose watery stools containing bile. These are usually mild cases. Severe cases of the disease particularly in patients who have been suffering for a day or two, before coming under treatment, improve more slowly.

RULES FOR ADMINISTRATION—In such cases the use of the drug must be steadily persisted in. As improvement takes place, the dose should be reduced, firstly in amount, and secondly in frequency. This sequence is important. It is better to give fairly frequent small doses, *ie*, fifteen to thirty grains than larger ones at longer intervals, though the total quantity taken in 24 hours may be the same. No definite rule as to reduction can therefore be laid down, each case must be treated on its merits, the necessary period of administration may extend from two or three days to as many weeks. So long as mucus is passed in any quantity it is an indication for giving the drug. One dose at least should be given at night during the acute stages. Human nature being what it is, it is well in practice to insist on this, or otherwise none is given between the hours of 10 P.M. and 6 A.M.

CONTINUANCE DURING CONVALESCENCE—When convalescence is established it is a good rule, at all events in severe cases, to administer a single dose of sulphate of soda (one drachm for an adult) the first thing in the morning daily for a period of two weeks to one month.

DEPRESSANT ACTION—This continuous administration is depressing, particularly in the old or infirm and needs watching.

The following is a better formula for continued use —

R	Sodu Sulph	3i
	Acid Sulph Dil	m ℥
	Spt Æther Sulph	m ℥ v
	Spt Chloroform	m ℥
	Aqua Menth Piperit	ad 3i

To which may be added Tinct Hyoscyami in v if necessary or cardiac stimulants, *eg*, Tinct Digitalis or Liq Strychnia, but to these I will recur. I have no hesitation in saying that if a specific for acute dysentery does exist, I believe it is in the judicious administration of sulphate of soda or magnesia.

METHOD OF ACTION—The rationale of their action is simple. The bowels are cleared of their irritating contents, the engorged vascular system of the large intestine is depleted and relieved and the flow of bile is promoted with as little disturbance to the damaged bowel as is possible to secure with any drug.

This depletory action is of the first importance. If the acute hyperæmia is not speedily relieved, the congestion gives place to stasis, and local necrosis of the mucous membrane, or even of the deeper coats of the intestine follows, sloughs form and separate by ulceration with fresh hæmorrhage, and if a fatal result does not supervene, clinically speaking, the case drags on, and the disease assumes the characteristics of the chronic type.

AT TIMES UNCERTAIN—In certain, not necessarily severe, cases the improvement under saline aperients is not immediate or marked. The motions though more watery and passed with less straining and tenesmus, still contain much blood, and the want of sleep, pain and general discomfort, rapidly cause profound nervous depression.

SIMULTANEOUS ADMINISTRATION OF IPECACUANHA—In such cases I never hesitate to administer ipecacuanha, while continuing the use of sulphate of soda in reduced doses.

Ipecacuanha not infrequently acts like a charm. Its discovery many years ago revolutionized practice in regard to the treatment of acute dysentery and reputations were founded on its routine use. Personally I am profoundly convinced of its value and I cannot help thinking that has undeservedly fallen from its high state.

RULES FOR ADMINISTRATION—In every case therefore which shows no marked improvement in 24 to 36 hours under the use of sulphate of soda alone, it should be tried. The chief objection to its use, *viz*, its emetic effects, has been greatly minimized by the introduction of the de-emetized powder. As even in this form it occasionally causes vomiting, it is as well to follow the old plan and give an opiate or sedative draught beforehand.

The following formulæ are as good as any —

R	Tinct Chloroform et Morphin Co	3i
	Aqua	ad 3vi
	Dose for adult 2 tablespoonfuls	
R	Pulv Ipecac	3i-s
	Glycerin	3ss

Mix and divide into 12 pills

Dose for an adult Three pills to be taken 15 minutes after draught twice daily morning and evening

This should be given twice daily for two days. If no good results, it should be stopped and the sulphate mixture alone continued. I do not advocate ipecacuanha in place of, but as an adjunct to saline aperients in bad cases. Its administration may prove the turning point in a severe attack.

OTHER DRUGS FOR HÆMORRHAGE—In cases in which blood in the stools persists in spite of improvement otherwise, calcium chloride in 10 to 15 grain doses and liquid extract of ergot in 15 minim doses 3 or 4 times in the 24 hours are of use. In such cases the hæmorrhage appears to come from ulcerated surfaces, and the hæmostatic effects of these drugs is of value.

STIMULANTS—The depressing effects of sulphate of soda have been noted above, and if it is necessary to continue it for any length of time stimulants must be given freely. Tr Digitalis or Strophanthus and Liq Strychnia in 15 minim doses can be added to the formula given above. Diffusible stimulants, brandy, whisky or rum should also be given in suitable cases, preferably with food and at frequent intervals. Their administration should never be delayed if the patient's condition demands them.

IMPORTANCE OF TREATMENT OF PATIENTS—Early and free stimulation in short is absolutely necessary in severe cases with great physical and nervous depression and *the treatment of the patient must never be lost sight of in the treatment of the disease*.

RESULTS AT HAZARIBAGH CENTRAL JAIL—During 1904 there were 218 admissions for dysentery in the Hazaribagh Central Jail with 5 deaths. All cases were treated as far as possible on the above lines, at all events during the last nine months of the year. This represents a case mortality of about 2 per cent. Two of the five men who died were worn out with chronic dysentery of long standing, and another was admitted to jail in a moribund state, too far gone for treatment of any kind to be of avail. Excluding these cases the case mortality was under 1 per cent.

STAGE OF CONVALESCENCE PERCHLORIDE OF MERCURY—As improvement takes place during the sub-acute and convalescent stages, perchloride of mercury, most conveniently given in the form of Liq Hydrag Perchloride, hastens recovery and prevents relapses. It stimulates the flow of bile, is mildly astringent and

decidedly antiseptic in its action. The following is a useful formula for routine use —

R	Liqr Hydrarg Perchlor	m 30-50
	Ammon Chloride	grs x
	Acid Muriatric Dil	m x
	Infus Quassia	ad 5i

Dose for an adult 3 times a day after food. To this may be added *Ti Nuc Vom* or *Ti Ferri Perchloride* if necessary. In selected cases one of the various preparations of bismuth is often of value at this stage, from its mild astringent and sedative action on the still irritable or possibly ulcerated mucous membrane. I may here remark that I think there is a tendency in treating dysentery to forget that we are dealing with inflamed living tissues, and to leave the bowel to recover itself.

BAEL—Bael fruit also may be given with advantage at this stage. The methods of preparation are familiar to all and need not be enumerated. If the flesh or raw fruit is not obtainable, the official preparation *Ext Belæ* Liquid answers well. Generally speaking I think milk is the best vehicle for Bael pulp.

CONTRAINDICATIONS—Both bismuth and bael have a constipating action in some subjects, this is a distinct contraindication to their use, but until they are tried it is impossible to say if they will have this effect.

QUININE—If pyrexia accompanies acute dysentery, quinine in full doses is always valuable. In some instances at all events the disease has a malarial origin, in others it brings out latent malaria. In all, quinine reduces the pyrexia and can do no harm. These are the lines on which I place reliance in the drug treatment of acute dysentery. They are open to the criticism that many drugs play a part in them. In mild cases many of them are doubtless unnecessary, but a severe case taxes all one's resources, and it is well to be armed at every point.

OPIATES—One word about the use of opium. By many it is absolutely condemned, I think on inadequate grounds. In a severe case the pain and discomfort, and accompanying prostration are so great, that its use is imperative. A small dose at night takes the keen edge off the patient's misery, and may secure an hour or two urgently needed sleep. Hot fomentations or turpentine stupes to the abdomen should always be given to relieve griping and abdominal pain.

IZAL—On January 1st, 1905, the treatment of acute dysentery with "Izal" was begun in the Hazaribagh Central Jail on the lines laid down by Major Vaughan, I.M.S., with the idea of making it the regular routine for a lengthened period.

Experience of it was so unfortunate that the practice was stopped after a trial of two to three weeks.

RESULTS AT HAZARIBAGH UNFAVOURABLE—Twenty-three cases were remaining from the previous year, 17 were admitted during January, several of a severe type, 6 deaths occurred during

the month. One of the men who died was the subject of chronic dysentery of long standing. Another, admitted on transfer, had been attacked on the road, and had been suffering severely for 3 days. His case was hardly a fair test. This leaves 4 deaths. In all the symptoms were severe with much blood and frequent motions. Treatment by Izal was then stopped.

There were at the time two more men suffering severely and steadily going from bad to worse. They were then treated with sulphate of soda on the above lines and both for a time improved, one of them relapsed and died in March, and the other after a desperate struggle, slowly convalesced and though much debilitated, is now on the high road to recovery. My experience of Izal is too limited for satisfactory criticism, but short as it was, it was so unfortunate that I should hesitate to adopt it again in preference to other measures.

So far I have dealt only with the treatment of acute dysentery by drugs administered by the mouth.

ENEMATA IN ACUTE DYSENTERY—Enemata and suppositories have their advocates. My experience of enemata has not been encouraging, that is in the acute stage. The rectum and lower bowel in severe cases are so intolerant that full enemata which may reach the upper part of the colon either cannot be administered, or if so, are immediately rejected.

INADMISSIBLE IN FULL QUANTITIES—Their administration only increases the discomfort and depression of the patient. Boracic or other mild antiseptic enemata are therefore inadmissible, except in such small quantities as render them practically valueless.

UTILITY IN SMALL QUANTITIES—When calls to stool are very frequent and ineffectual, washing out of the rectum with a few ounces of normal saline solution or a weak solution of bicarbonate of soda may give temporary relief and is worth trying. It may be followed by a diachm of tannic acid and ten grains of Dover's powder suspended in one and half ounces starch mucilage (for an adult). These measures are palliative only, but are well worth trying, if they only secure a little rest and sleep.

ALSO USEFUL IN SUB-ACUTE STAGE—When the disease has passed the acute and entered on the sub-acute stage, an occasional saline enema is unquestionably useful to get rid of irritating scybala, but this should not often be necessary if the bowels are kept quietly acting with saline aperients as above described.

CHRONIC DYSENTERY—The drug treatment of chronic dysentery is a still wider subject. I can here allude only to a few points.

CLINICAL TYPES—There are two fairly distinct clinical types, one in which diarrhoea is a fairly constant symptom, another in which intermittent constipation and the passage of mucus with scybalous motions, exists. In all subjects of chronic and relapsing dysentery more or less

extensive ulceration exists, and this is the keynote to treatment

ENEMATA—Speaking very generally drug treatment by the mouth is not satisfactory, and topical treatment by the routine use of full enemata is indicated. Technique is of the first importance and the treatment is tedious and troublesome. Details are unnecessary here, they can be found in any text-book.

METHOD OF ADMINISTRATION—As good a plan as any is to first evacuate the contents of the lower bowel by a full enema and then administer a smaller astringent enema to be retained as long as possible—as the latter alone can be given after a natural action.

The following are convenient formulæ—

(a) R Sodio Bicarb $\overline{\text{ssvi}}$
 Pulv Boracis $\overline{\text{ss}}$

Mix and divide into 10 powders

DIRECTIONS—One powder to be dissolved in a quart of warm water for use as an enema once daily

(b) R Glycerin Acid Tannic $\overline{\text{ss}}$

Direction, one teaspoonful to be added to a pint of warm water and used as an enema after an action. To be retained as long as possible. Stronger astringents are sulphate of copper and nitrate of silver. No stronger solution than 5 grains to a pint of water should be used to begin with, later if necessary they can be cautiously increased in amount.

ASTRINGENTS, ETC., IN DIARRHOIC TYPE—In the diarrhoic type astringents by the mouth are useful, in European practice their use is too much neglected, in native practice they are largely employed and unquestionably with success. Bael fruit particularly should always be given. Mild antiseptics, *e.g.*, salol and salicylate of bismuth have usually to be continued over long periods, and the familiar *Pil Plumbæ* opio is worthy of a trial. Of all drugs, however, I incline to the use of *Liquor Hydrag Perchlor* in 30 to 40 minim doses 3 times a day for an adult.

CONTRAINDICATED IN CONSTIPATION—The second clinical type with intermittent constipation is more difficult to treat. Astringents by the mouth are out of the question and only aggravate the trouble which ends in a burst of diarrhoea or it may be in an acute attack. Enemata are open to the objection that under their continued use the lower bowel further loses tone.

USE OF APERIENTS—All powerful vegetable and other purgatives particularly aloes are absolutely harmful. Castor oil in a single dose of one teaspoonful the first thing in the morning, sulphate of soda, citrate of magnesia, Hunyadi water or Carlsbad salts are the only aperients that should be given.

Of all the troublesome complaints the physician may have to treat, post dysenteric constipation occupies a very prominent position.

Intercurrent attacks of acute dysentery must be treated in the usual way.

IMPORTANCE OF GENERAL MEANS—I have said nothing about diet and general means which in chronic dysentery at least are of equal importance to treatment by drugs.

SUMMARY—In acute stage—

- (1) Treatment should be commenced at the earliest opportunity
- (2) Sulphate of soda continuously administered in small doses give best results
- (3) De-emetized ipecacuanha in addition should be given in severe case, or when improvement is slow under sulphate of soda
- (4) Cardiac and general stimulants must be freely given
- (5) Palliative measures are always useful, an opiate if necessary should never be withheld, and lastly, never forget the treatment of the patient in the treatment of the disease

In sub-acute and convalescent stage—

- (1) A saline aperient once daily
- (2) *Liq Hydrag Perchlor* in 40 minim doses with or without bismuth, is a second routine
- (3) Bael fruit twice daily

In chronic stages—

- (1) Intestinal antiseptics by the mouth, and
- (2) Astringent enemata give the best results, but general measures, diet, change of air and rest, are at least of equal importance

DYSENTERY AND DIARRHOEA MORTALITY IN THE BOMBAY PRESIDENCY

By W E JENNINGS, M.D., D.P.H.,
 MAJOR, I.M.S.

THE excessive mortality from all causes with which the prevalence of famine in the year 1900 was attended, included a very unusually large proportion of deaths from dysentery and diarrhoea. The death-rate from these diseases alone was 11.59 per 1,000 of the population as against a mean ratio of 3.07 for the preceding five years. Erroneous conclusions would, therefore, result from the inclusion of the statistics of that year with those of the years making up the quinquennium ending 31st December 1904. A comparison, however, of the remaining four years of that period shows a fairly constant death-rate from these diseases, not only in the Presidency, as a whole, but also in the main registration divisions and in the individual districts which make up those divisions.

Table A, for example, gives the dysentery and diarrhoea death-rate per thousand of the population for each of these years, the mean ratio being 3.19, which accords closely with that for the quinquennium ending 31st December 1899, which, as has been seen, was 3.07. This indicates that the four years under review might be regarded, so far as these causes are concerned, as practically normal years.

Table A

Year	Death rate from dysentery and diarrhoea per thousand of the population
1901	3.26
1902	3.17
1903	3.00
1904	3.33

For registration purposes the Presidency is divided into five divisions known as the Western, Central, Southern, Gujarat, and Sind Registration Districts. A comparison of the dysentery and diarrhoea mortality in each of these districts per annum would be represented by the relation to each other of the figures in Table B. While, broadly speaking, this comparison indicates a fairly constant mortality, there undoubtedly appears to be an upward tendency in the Western District. The greater mortality in the Central and Southern Districts in 1901, and in the Gujarat District in 1901 and 1902, than in the following years, might reasonably be attributable to the effects among the population of famine.

Table B.

Registration District

Year	Western	Central	Southern	Gujarat.	Sind
1901	17.8	26.0	12.0	3.5	6
1902	22.7	22.7	8.4	3.8	8
1903	23.4	21.1	8.5	1.7	5
1904	26.2	23.0	8.5	1.7	5

Analysing the returns from these divisions, the relative mortality in each of the component districts of them, for each year of the period, bears the relationship expressed by the figures in Table C. From these it will be seen that the upward tendency in the Western District referred to above, is due to increased mortality from the diseases in question in the Khandesh and Nasik Districts only.

Table C

Western Registration District

Year	Khandesh	Nasik	Thanna	Bombay	Kolaba
1901	7.9	3.6	1.0	3.6	1.5
1902	11.5	4.8	1.2	3.6	1.4
1903	12.8	3.4	1.1	2.7	1.2
1904	14.1	5.9	1.3	2.7	2.0

Central Registration District

Year	Ahmednagar	Poona	Sholapur	Satara	Ratnagiri
1901	5.5	5.6	5.8	5.6	3.2
1902	4.5	5.8	4.5	4.4	3.3
1903	5.0	4.5	3.2	4.0	3.3
1904	5.0	5.2	4.2	5.3	4.0

Southern Registration District

Year	Belgaum	Dharwar	Bijapur	Karwar
1901	6.1	2.6	2.3	8
1902	3.9	1.9	1.9	6
1903	3.5	1.9	2.2	8
1904	3.1	1.8	3.2	3

Gujarat Registration District

Year	Surat	Broach	Kaira	Panch Mahals	Ahmedabad
1901	5	2	1.5	1	1.1
1902	5	2	1.4	1	1.4
1903	4	1	7	0.5	3
1904	4	1	7	0.6	3

Sind Registration District

Year	Karachi	Hyderabad	Thar & Parkar	Larkhana	Sukkur	Jacobabad
1901	2	2	0.1	0.2	0.9	0.06
1902	3	3	0.1	0.2	1	0.2
1903	2	1	0.1	0.7	1	0.2
1904	1	3	0.2	0.3	0.8	0.07

No clue exists as to the proportion of deaths to attacks, nor can any definite idea of this be gained by comparing the deaths registered with the numbers treated in civil hospitals and dispensaries. The figures representing the latter are, at present, only available for the first three of the years under review, and Table D exhibits the comparison in question. The figures indicate that a very large number of cases do not avail themselves of hospital and dispensary treatment, but probably have recourse to native methods or die untreated.

Table D

Year	Numbers of cases of dysentery and diarrhoea treated in civil hospitals and dispensaries in the Bombay Presidency	Total numbers of deaths from dysentery and diarrhoea registered in the Bombay Presidency.
1901	52,899	60,193
1902	76,155	58,682
1903	66,904	55,443

The statistics to which the above figures refer include deaths among the native population only.

Table E gives the deaths from these causes among Europeans and Eurasians in Bombay City and in the Mofussil separately

Table E.

Dysentery and Diarrhoea Mortality among Europeans and Eurasians

Year	Bombay City	Mofussil	Total
1901	12	2	14
1902	12	8	20
1903	7	8	15
1904	7	6	13

The European and Eurasian population in the Mofussil being a fluctuating quantity, no definite conclusion can be drawn from the above table so far as they are concerned, but that in Bombay City being more or less fixed, and the total mortality not varying within wide limits, the percentage of the total mortality which the figures in Table E would represent for each of the years, respectively, viz, 36, 34, 28 and 22, would appear to indicate a decreasing incidence among Europeans and Eurasians

TREATMENT OF DYSENTERY

RY BARU AMRITO LAL DEB,
Assistant Surgeon (Retired)

WITH reference to the article headed "a new remedy for dysentery" which appeared in October 1878 number of your world-renowned journal, allow me to say a few words upon the virtues of the drug known as *Ixora Coccinea* in the treatment of acute bloody dysentery. I have devoted my whole life in experimenting its virtues, and I am happy to be able to say that I have found the medicine most efficacious in a large majority of cases treated both in my private practice as well as in hospital. Even men of the position of the late Dr Bird and Dr Pilcher have pronounced the drug as invaluable in the case of acute bloody dysentery, I quote the following from the annual report of the Howrah General Hospital for the year 1876 by Dr Bird, the then Civil Surgeon of Howrah:

"The root of the Rangouphul plant (*Ixora Bhandhuca*) deserves to be honorably mentioned. It was brought into use by Assistant-Surgeon Umrito Lal Deb, and as yet has not achieved a place in the Pharmacopœia. It appears to me to be as certain a remedy in the treatment of dysentery as *ipeacuanha*, and it possesses the advantage over the latter that its use does not induce nausea

* * * * *

The shrub grows abundantly and enormously in and around Calcutta and can easily be cultivated to an extent to supply the drug markets of

the world, on the other hand, it is not to be forgotten that all attempts to naturalize the *ipeacuanha* plant in India have failed."

Dr Pilcher, late Civil Surgeon of Howrah and afterwards Inspector-General of Civil Hospitals of Bengal and the United Provinces of Upper India, expressed his opinion about the drug in the following terms. He was empowered by Government to try this remedy:

"I have no hesitation in reporting that the drug was very efficacious in dysentery, and that the best results have attended its use among Europeans and natives in this hospital. Some cases of dysentery did not appear to be affected by the drug in either way, but this is the case with *ipeacuanha*. The drug was most efficacious as is the case with *ipeacuanha*, when the cases treated by it were seen early. I gave it with confidence in all ages and consider its operation in dysentery nearly equal to that of *ipeacuanha*."

Allow me to add that the numerous additional experiments which have been made by me have generally confirmed my earlier conclusions as to the nature of the drug in dysentery.

The method of preparation employed was grinding the fresh root down on a curiystone with a small piece of long pepper and mixing the pulp so produced with water, or by preparing a tincture of 4 ozs of the root to a pint of proof spirit. The dose of the root was 10 to 30 grs two or three times a day and the dose of the tincture 3i to 3iss three a day with few drops of tincture opii according to the age and constitution and requirements of the patients. Tincture *ixora* acts well with or without opium. Tincture opium or long pepper adds to its efficacy and does no harm and acts promptly. The treatment of acute bloody dysentery with root or tincture *ixora* will remove a long-felt want. It is cheap and very efficacious and not requiring any special training to use the remedy and quick in its action, innocuous, tasteless aromatic cholagogue and alterative in its action. Not laxative, not purgative, it does not produce nausea and vomiting like *ipeacac*, it is not ecbohic like *ipeacac*, and is suitable in dysentery cases even in pregnant state, and it does not produce giddiness like *cannabis indica* to adjust the dose of which is very difficult for an ordinary man in individual cases. It does not act as a purgative like *magnesia sulphate* which is always used with tincture opii or liquor morphinæ and dilute sulphuric acid to guard its action and is not suitable for weak persons and in all cases. Corrosive sublimate used in dysentery requires a medical attendant for instruction and guidance. It is a deadly poison and requires great care in administration. *Ixora* is suitable in acute dysentery in all ages, weak and old, it is easily available in all places, and useful especially in the hæmorrhagic variety, and though it is not infallible in all cases—successful in most cases. It is more useful in fresh state and as certain as *ipeacuanha*. Native men, women and children and

Europeans of high class cannot bear ipecacuanha. Castor oil as a preliminary treatment in the treatment of dysentery or castor oil emulsion in the treatment of dysentery of children is not required, its nauseous smell or taste is not borne by all. Tincture of vinum ipecac does no good in dysentery. Tincture ioxa when mixed with tincture opii and water forms a precipitate and does great good in dysentery. It does not act as astringent or purgative. In low cases when patients suffered from diarrhoea previously, it does great good when care is taken about diet and other hygienic conditions. Within a very short time as 24 hours dysenteric stools are changed into natural stools or into bilious stools—tenesmus and tenesmus also disappear. Tincture opii is very useful in dysentery or diarrhoea—no harm is done if properly used—no medical man ought to have a prejudice to use this.

The introduction of this valuable medicine into the British Pharmacopœia in the treatment of *acute bloody dysentery* will remove a long-felt want, and thereby save the life of millions who now and then fall a victim to this dire disease, *viz*, dysentery, and are carried off to the grave though untimely for want of a proper cheap and efficacious medicine like this.

Will you take up the matter in hand for the sake of suffering humanity ventilate the matter in your much-esteemed journal with a view to induce the Civil Surgeons of all the districts, Assistant Surgeons and Civil Hospital Assistants to take an interest in the matter and give it a fair and judicious trial without any prejudice against this indigenous drug in all hospitals and in private practice. Native gardeners (*mallees*) in all the villages and towns will be able to supply the plant or the root. Rich men and zemindars will be able to help in this matter, care is necessary in digging out genuine roots from the ground. Henceforth people should exert themselves to propagate this plant.

A CHEMICAL PROCESS OF STERILIZING WATER FOR DRINKING PURPOSES FOR USE IN THE FIELD AND AT HOME

By V. B. NESFIELD, F.R.C.S. (LOND.),

LIEUT., I.M.S.

NOTES AND BACTERIOLOGICAL REPORT

By F. N. WINDSOR, M.B., B.A., B.Sc.,

CAPTAIN, I.M.S.,

Officiating Chemical Examiner & Bacteriologist, U.P.

THE great incidence of typhoid and dysentery during the South African war, brought prominently forward the extreme necessity of some convenient method of purifying drinking water in the field, so as to prevent the occurrence again of such a large mortality from these infections, and therefore theoretically preventable diseases.

The introduction of some good system is considered to be as important to the army, as the invention of a new gun or rifle, and it is to bring forward this somewhat neglected subject, and to introduce a method at the same time that this article is written.

A little thought on this subject (of a suitable method of purifying water in the field) leads one from the first to put aside all those methods dependent upon filtration and heat. Filters are inconvenient, as they readily break, act slowly, and soon become choked, while heating apparatus has the disadvantage of bulk and slow action, and besides that requires the carriage of fuel.

So that it soon becomes apparent that attention must be directed to perfecting the only possible remaining method, "the chemical," for solution of this problem.

With this aim in view, I drew up for my guidance in July 1902 certain postulates which must be fulfilled before a chemical process can be stated to be perfect both in theory and practice. I venture to give the postulates which are as follows—

The chemical used must be—

- (1) Stable and not affected by climate
- (2) It must be certain in its action on all waters, and in whatever vessel the water is contained
- (3) It must be portable and simple
- (4) It must in no way have any deleterious effect on those who drink water purified by it
- (5) It must leave the water clean and tasteless
- (6) It must act rapidly

The postulate most difficult to comply with is No. 4, and so I used this as a working basis.

It appeared that the least harmful of all materials would be something which occurred in all natural waters, if only it could be used in the same proportion as it is naturally present.

On carefully looking into the composition of water, we find that besides the hydrogen and oxygen which combine to form that element, there are traces of many dissolved substances picked up from the air and the earth.

Now the question is, are any of these dissolved substances germicidal? The answer is decidedly not, but if we go further and examine into their elemental composition, we find that a great many in a modified form are so. As an example sodium sulphate might be quoted. The sulphuric acid it contains is most certainly germicidal when set free from sodium, but sulphuric acid is a very inconvenient substance, firstly, because it is not a powerful germicide, about 0.2 per cent being necessary.

It can be made portable as the acid sulphate of soda, and was used as such in South Africa, 15 grains being used with each pint, but the acid caused dyspepsia, and was most objectionable to the taste, also it dissolved the metal of the water-bottles to the extent of 3.5 grains of iron per gallon in 12 hours, and the oftener

it was used, the more metal was taken up, owing to the cleaning of the inner surface of the bottles by the acid

The nitrates at first looked hopeful, but had to be discarded, and to make a long story short, the chlorides were found to fulfil all the postulates

The quantity of sodium chloride naturally present in good river or well water has no germicidal action whatsoever, but if it be split up into its elements, then it is found that it contains more than sufficient chlorine to sterilize the volume of water containing it, and when the free chlorine is again converted into chloride, the water is found to be in its original tasteless condition

Now, experiment shows, that when one gramme of free chlorine is present in 100 gallons of water (1 part in 451,612) all cholera, typhoid and coli bacilli, contained in it, die. For these experiments the water must first be sterilised and then infected with the above-mentioned organisms, as this quantity of chlorine has no action against spores

But water absorbs a certain quantity of chlorine dependent upon the quantity of albuminoid and organic material dissolved in it, these organic substances in the worst examples are equivalent to one gramme of chlorine per 100 gallons, as in the case of an old disused well River waters, for instance, the Jumna, near Agra, absorb only 0.531,861 gramme of cl per 100 gallons

It must be noted that calcium carbonate does not absorb any chlorine

Thus it is necessary to add two grammes of chlorine to every 100 gallons of water to rid it of cholera, typhoid coli and in fact most non-sporing organisms. This requires 30 minutes' action, after which time the free chlorine is absorbed by sodium sulphite, and the water is now in the same tasteless condition as before the sterilization. In fact it only differs from untreated water by containing a trace more of chlorides (1 part in 225,806 parts) and twice that quantity of sodium sulphate. Fifty-one grains of sodium chloride contain sufficient chlorine to sterilise 100 gallons of water

So much then for the process from a laboratory point of view, what now has to be considered is, how can this system be rendered practicable in the field and on the march so as to fulfil postulate No 3. At first this was a difficult problem, and required a great deal of work with pressure pumps and freezing mixtures in order to liquefy the gas

The final and complete plan devised is the following —

I — Steel cylinders lined with lead, and holding 3 lbs of liquid chlorine are used. The cylinders are made of such strength to withstand the pressure resulting from a temperature of 200° F

Liquefaction of chlorine is not as a matter of fact difficult, as only six atmospheres pressures are required at 0°C

II.—Each cylinder is provided with a screw tap and a narrow-bored nozzle

III.—To the nozzle is attached a strong but small-bored aluminum tube six feet long terminating in a thickened extremity weighted with four ounces of lead. The extremity is perforated with one narrow opening and is made detachable for cleaning purposes

IV.—A collapsible canvas cask holding 50 gallons of water weighing only a few pounds is necessary as a receptacle. A heavier and stronger one is being prepared which will be more durable for active service

V.—The method of using the cylinders is as follows —A fifty-gallon cask being filled with water, the tubing of the cylinder is placed at the bottom of it. The cask should be deeper than it is wide. The tap which can go through only one full rotation is then turned on. By a very simple arrangement one gramme only of liquid chlorine is allowed to pass at one time, the liquid chlorine becomes gaseous in the tube and at the junction of the tube with the water, so in this way chlorine enters the water in almost a nascent condition

The water must be given a circular motion before the bubbling is commenced

VI.—Leave for 30 minutes

VII.—Add one tablet of sodium sulphite (it is better to crush it first in a little of this chlorinated water and then to pour this strong solution of sulphite into the water) this tablet is made half again the size that is necessary to neutralize one gramme of chlorine, namely, 36 grains for 50 gallons

VIII.—A large stock cylinder holding 40 lbs of liquid chlorine fitted with screw tap and short strong tubing is needed as a reserve, when a small cylinder has been emptied, it is returned to the base. It is connected with this large cylinder and cooled by a wet cloth and a draught of air, so as to reduce its temperature about 10°F below that of the large cylinder. On opening the cocks, the liquid chlorine slowly vaporizes over from the large warm to the smaller cooler cylinder, which is now ready for use again

A cylinder containing 3 lbs of liquid chlorine sterilises 680,388 gallons of water, takes up a very little space, is light and readily carried on a man's back, being provided with straps for this purpose

A special man, a non-commissioned officer for preference, should be told off for this particular work, and should be fully instructed in the method of working the cylinders. He should on arrival in camp see to the filling of the water butts, and should at once proceed with their sterilization, 100 gallons or any quantity take very nearly the same time to sterilize

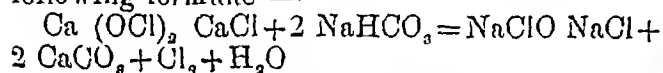
The men are then only permitted to drink this water, and should be ordered to fill their

water-bottles, before marching next morning from the same supply¹

II—There is still an obvious break in the chain of measures directed to the preservation of the men from typhoid, cholera and dysentery, because when on the march, the contents of the water-bottles having been used, the men will drink from the first stream they come to. To prevent this, some method must be employed which can conveniently be used for sterilizing a pint of water only.

For this purpose I endeavoured to produce a tablet which would evolve chlorine and yet be stable. To this end I used many materials and combinations, which in the presence of water would evolve chlorine. The best combination was chlorinated lime 1 grain and bicarbonate of soda $\frac{1}{2}$ grain, compressed into a tablet, which is readily made, and requires no adhesive material for its solidity. This tablet when placed in water evolves free chlorine, gradually becoming firmer, till after five minutes when all the chlorine has been given off, it is left as a hard solid body which proves to be chalk, the water in the meantime having been rendered sterile. The water is now dechlorinated with $\frac{1}{4}$ grain of sodium sulphite in tablet form, and is now fit to drink, being tasteless and clear.

The chemical changes which occur are rather complicated, but may be represented by the following formulae—



When these tablets are fresh, there is no doubt about their efficacy, but they tend to deteriorate, and so I reluctantly gave them up, and was forced to look to another of the halogen family for a solution of this problem. The most suitable material found was iodine, which, although a foreign substance to the human economy, is yet used in such minute quantities, as to be negligible as regards any physiological action.

In February 1903 I produced a triple tablet system, which gave most excellent results, and which I now attempt to bring forward for general use.

The three tablets consist of the following—

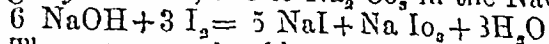
- 1 An iodide tablet, weight two grains
- 2 A citric acid tablet, weight two grains
- 3 A sulphite tablet, weight $1\frac{1}{2}$ grains

The method of preparing the iodide tablet which is the really difficult one, is as follows—

Iodine and fresh solid sodium hydrate are ground together and a little water added continually, the iodine is quickly removed from its free state, but sufficient must be left to leave the solution a dark brown colour, this is then evaporated to dryness, and heated till all the free iodine is driven off, it is compressed while hot and makes an excellent non-deliquescent tablet, but readily dissolving when placed in water.

Should the tablet deliquesce, it contains traces of free NaOH, and shows that in the making of the iodide material, care was not taken to have

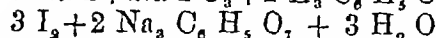
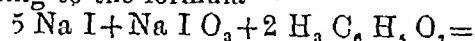
an excess of free iodine. The tablets are always slightly alkaline, due to Na_2CO_3 in the NaOH.



The citric acid tablet is compounded with dextrose as a binding agent and is non-deliquescent, it contains a trace of chalk, so as to cause its more rapid disruption when placed in water.

The sulphite tablet is also non-deliquescent and made from the dried salt.

I—One of each of the acid and iodide tablets is placed in an ounce of water, and then solution helped by crushing. The materials interact according to the formula—



producing a dark-coloured iodine solution²

II—This iodine solution is now poured into four gallons of water which should then be stirred effectually.

III—In five minutes the sulphite tablet is thrown in, and the water stirred a little, all free iodine at once disappears, leaving the water sterile clear and in the same tasteless condition as before the addition of the tablets.

These tablets are too large for all purposes, and others are made of various sizes, the most convenient, and the one intended for the army is a set of tablets weighing $\frac{1}{4}$ grain. These are packed in a small box containing three small tubes holding 25 tablets each, the iodide and acid tubes being united, and are intended for sterilizing from one to two pints of water, the time taken being five minutes.

The method of using them is similar to that for the larger ones, but should there be no vessel at hand in which to primarily dissolve them, the following manoeuvre does very well indeed—

In the case of a water-bottle, pour some water into it, and then pour the water out again, this leaves about one or two drachms in the bottle, drop in an iodide and an acid tablet labelled A and B, and help their solution by a little circular movement of the water-bottle, they should be given two minutes for their thorough solution. Pour water up to two pints into the bottle, and leave for five minutes, then clear as before with the sulphite tablet.

There is no difficulty about knowing which tablets to add, etc., as the iodide and acid tubes are united, so showing that their combined action is necessary, the development of the brown colour (deepened by the dextrose in the acid

¹ This process was exhibited at the Millbank Barracks and described in the *Times* of February 13th, 1905, see Report J. V. G., M.A. (p. 186). For some reason the liquid chlorine was not mentioned, and chlorinated lime and bicarbonate of soda are stated to be put into the water, this is not correct for unless they are combined together in solid state free Cl₂ is not liberated, in consequence the sulphite of soda is not quite capable of removing the taste, which is due to undecomposed hypochlorites. The process described in the same paper as Georges and Vaillards is practically the same as mine, though I brought the CaI and the I process to the notice of the medical department of the War Office at the same time. I think that the iodine process was

² $\text{NaClO} + \text{NaCl} + 2 \text{NaHCO}_3 = 2 \text{Na}_2\text{CO}_3 + \text{H}_2\text{O} + \text{Cl}_2$
or $\text{Ca (HCO)}_3 = \text{CaCO}_3 + \text{Na}_2\text{CO}_3 + \text{HCO}_3 + \text{Cl}_2$ from the water

tablet) also is an indication of the correctness of the manipulations

For private use as for travellers or shooting-parties, a convenient plan is to carry an empty whisky bottle (26 ounces) and to use one tin of these tablets to the bottle filled with water, this water can be aerated in a sparklet syphon, and makes excellent sodawater for spirits, etc

For the bacteriological experiments the water was first sterilized, and then infected with a growth of typhoid or cholera, etc, from agar. The sterilizing process was gone through either by the chlorine or the iodine method, and cultures taken, there being always a control experiment. The chlorine value is given above,* the iodine value is that two grains of iodide and acid sterilize eight gallons of water in one minute (equivalent to 1 part of iodine per 520,446 parts). For matters of safety this two-grain tablet is recommended for four gallons of water, and the time given is five minutes.

It is most important to note that when sterilization is mentioned in this paper, except when specially stated otherwise, it is meant as regards typhoid, cholera, and Shiga's dysentery bacilli.

It is necessary to mention a few points bearing upon the chemistry of iodine and chlorine.

1 Carbonates and bicarbonate, or any of the salts present in natural water, have no action on chlorine or iodine.

2 Cl and I combine powerfully with albumens, peptones and albuminous substances, so much so that the addition of strong Cl water to a 10 per cent solution of peptone, causes sufficient heat to bring about ebullition and all Cl disappears. Peptone decolourises an iodine solution.

3 They do not, when in the dilutions mentioned, act upon the metal or wooden walls of vessels.

3a They are extremely diffusant.

Then instant physiological action when in solution as regards the death of bacteria is probably due to the chlorine or iodine diffusing rapidly through the porous bacterial envelopes, and combining chemically with the bacterial protoplasm which iodine tends to coagulate. Chlorine possibly forming a substitution compound, this compound readily putrefies when re-exposed to bacterial infection.

4 A peptone free emulsion of any organism say typhoid (use a good quantity), when added to a weak iodine solution gradually decolourises it, the bacteria settling to the bottom stained dark-brown, showing then actual chemical combination with the iodine.

put aside, because I merely demonstrated it, and said that if they desired it, I would bring tablets to do the same reactions. I did not know of the existence of any other workers on the same lines till the article appeared in the *Times* of February 13th, 1905, received in India a month later. To tell the truth I received no encouragement from the War Office, Medical Department.

* One gramme of free cl per 100 gallons 1 part in 451,612, but two grammes are used, about 1 gramme of which is only absorbed, making $\frac{1}{2}$ gramme in excess.

5 Chlorine is a strong oxydizing agent, and iodine also to a lesser degree, but it is a great mistake to imagine that the powerful germicidal action of both of them is due to oxydation of the bacteria, or their burning up as it is sometimes stated, for this germicidal action is as powerful in the dark as it is in the light. The oxydizing properties are of course most useful in removing any smell.

III

To prepare sterile water in the field, to be kept in a sterile bottle for surgical purposes, or for dissolving dried serums as used in veterinary practice, and for sterilizing syringes, etc, dissolve a 2-grain (4 gallon) iodide and acid tablet in an ounce of water, and pour into a pint bottle full of water, suck a little up in the syringe to be sterilized, leave for five minutes.

Pass the sulphite tablet through a spirit flame, and drop into bottle, shake till water is clear and wash out the syringe with this.

Dissolve the dried serum in this water. This serum solution can now be injected with perfect confidence that it will not produce suppuration.

In conclusion I have only to add, that for purifying wells and ponds, the chlorine system is most efficacious and simple, the quantity of water being known, one gramme of chlorine is used for each 100 gallons, and no sulphite added, the cl gradually passing away from the water.

In actual practice the iodine method was used in June 1904 during the Sikkim Tibet Expedition for a batch of 700 coolies passing through Sikkim in the Teesta Valley which was badly infected with cholera.

Empty kerosine oil tins were filled with water about at every two miles interval (there being hundreds of streams) the water was sterilised by the iodine method, and the coolies (Cashmeers) told only to drink this water and frightened into it with the threat that if they did not, they would get cholera. I was most careful to see to all the arrangements myself at each post.

This was the only batch of coolies who passed through from June to September without having a case of cholera. That the water is tasteless and harmless is shewn by the fact that the officers of the 1st Brahmins "Mess" have drunk no sodawater save that prepared by these iodine tablets for the last five months. They were unaware of this and never complained of the taste. (During the March from Allahabad to Jubbulpore the water was so bad, that it would have been impossible to have any soda except for the use of these tablets, for there was no time for filtering or boiling.) A great many people in Jubbulpore are also supplied with this sodawater daily, which is stated to be excellent.

Messrs Smith, Stanistreet & Co, Calcutta, have very kindly undertaken to prepare the tablets for me.

(To be continued)

Indian Medical Gazette.

JULY, 1905

SPECIAL DYSENTERY NUMBER

FOR the special prize of Rs 100 (one hundred rupees) kindly offered by Messrs Thacker, Spink & Co, the Proprietors of the *Indian Medical Gazette*, the above nine papers on Dysentery have been sent in —

Colonel S H Browne, M.D., C.I.E., Inspector-General of Civil Hospitals, Bengal, and Lieutenant-Colonel G F Harris, M.D., F.R.C.P., Professor of Materia Medica, Medical College, Calcutta, have kindly consented to be the Judges and to award the above prize for the best article on Dysentery here published

The name of the successful competitor will be communicated to him as soon as the Judges have sent in their award, and his name will be announced in our next issue

Owing to the present number being a special one, a large number of articles in hand have had to be kept over till next issue

THE PROGRESS OF OUR KNOWLEDGE OF DYSENTERIES

It would be difficult to over-estimate the importance of dysentery in India, although the vital statistics of the general population are still far too inaccurate to allow of the real death-rate from this group of diseases to be estimated, as was well shown in a recent report on the health of certain districts of Bengal, where only about one case in sixty dying of bowel complaints were correctly returned under that heading. Nevertheless, the fact that dysentery causes the highest death-rate of all diseases in the large and carefully-controlled jail population of India, as well as the second largest admission-rate, is enough to prove the widespread and serious nature of these affections. Taking this into consideration, it is a matter for regret that so little modern research work has been carried on of recent years in India on the subject of dysentery, and that most of the advances of our knowledge have come from other countries. This is all the more remarkable when we turn to some of the older books on researches into Indian diseases, as in the works of Annesley, Norman Chevers, Fayrer, Morehead and Lewis and Cunningham very great attention is paid to

this difficult and all-important subject. This is especially the case with Annesley's classical volumes on Researches in India, in which a number of very excellent coloured plates of a large size are published. The difference may be partly due to the greater liberality—we will not say enlightenment—of the old John Company Government, who bore the cost of the publication of Annesley's large volumes, as compared with the present system under which the publication of some beautiful coloured plates illustrating the different forms of dysentery was not very long ago declined by the Scientific Memoirs on the score of expense.

The recent evolution of our knowledge of dysenteries of course dates from the rise of bacteriology and parasitology, which has gradually led to the now very general acceptance of at least two totally distinct forms of dysentery depending on the causative factor being either of a bacillary or of an amoebic nature. The former group comprises the largest number of cases in India as in most other countries, so it will first be considered.

During the last ten years an immense amount of bacteriological work has been done outside India on dysentery, and a very large number of different organisms have been described as producing the affection. It was not, however, until Shiga described the bacillus called after him that any general acceptance of the bacterial origin of the disease was brought about, although it appears that the same organism had been described at an earlier date, more especially by Chantemesse and Widal. Flexner next described an organism belonging to the same group which occurs in the dysenteries of Manila, but which differs in some respects from that of Shiga. Other organisms producing dysentery have been described all belonging to the same large branch of the coli group of bacilli intermediate in their cultural characters between the typhoid bacillus and *B. coli communis*, so that a recent writer divides the dysentery bacilli into four main groups, each of which has cultural and also agglutinative properties, which distinguish it from the rest and from the typhoid bacillus. The first includes those of Shiga and Krause, being characteristic in not fermenting mannite. The second group is represented by the bacillus Y, the third by Strong's Philippine culture, and the fourth includes Flexner's Manila and Duval's Baltimore cultures. As already stated, but little work has been done on

this part of the subject in India, but Rogers in Calcutta and Pridmore in Burma have made a few observations of interest. The former isolated a bacillus belonging to the Shiga group, and obtained serum reactions in a series of dysentery cases both with this organism and also with those of Shiga and to a less extent with Kiause's bacillus, but failed to get any reactions with Flexner's bacillus. On the other hand, one amœbic case gave a negative result with all three varieties. Pridmore also isolated an organism of the Shiga group, and obtained serum reactions both with it and with Shiga's bacillus. As far as these observations go, they point to the dysentery of Eastern India as belonging to the Shiga variety. On the other hand, Grieg has found microscopically an entero-coccus in the dejecta of some dysentery cases in the Swat Valley. As, however, this organism is admitted to be a normal inhabitant of the intestine, its unusual prevalence in some cases of dysentery may be rather of the nature of a coincidence than a causative factor. The observations of Firth at the Army Medical School are of considerable interest and importance, for in addition to studying the cultural characteristics of the different varieties of dysentery bacilli, he also produced ulceration in the large bowel in rabbits by administering these organisms. Some recent observations of Todd at the Lister Institute in London are also of practical importance, for he has shown that the Shiga group of dysentery bacilli produce a toxine, which is neutralised by an antitoxine produced by repeated injections of the bacilli toxines or the bodies of the young bacilli. Further, bacilli from English asylum dysentery formed a similar toxine which was neutralised by antitoxine formed from Kiause's bacillus which strongly points to English asylum dysentery being identical with tropical bacillary dysentery, as has long been suspected by Indian observers. This serum is said to give very favourable results experimentally, and as it is being tried clinically in the Calcutta hospitals at the present time, we may hope that it will prove equally effective in the treatment of the more serious class of cases, that is, in those which the now widely used saline treatment fails to check within a few days.

On turning next to the amœbic form of the disease with the closely-associated liver abscess formation, we find that a long controversy is only now beginning to produce a fairly general

consensus of opinion concerning the differentiation and pathology of this form of dysentery. From the time Losch described amœbæ in the intestinal canal in 1875, through Cunningham's studies of the life history of the organism published in 1881, the observations of the French writers Kaitulis in 1886 and of Kiause and Pasquale in 1893 on Egyptian dysenteries, of Councilman and Lafey in America in 1891, down to the more recent observations in India, more especially of Rogers in Calcutta, the body of evidence has steadily accumulated in favour of the amœba dysenterica as the cause of the very characteristic lesions of the large bowel containing numerous living amœbæ and associated in a large proportion of cases with liver abscess, also containing amœbæ, and as a rule no other parasitic organisms. Indeed, the *post-mortem* lesions in this form of dysentery are so strikingly characteristic as compared with those of the bacillary type of dysentery that they must have been recognised by many Indian observers. That this is so can be shown by an examination of the writings of some of the older Indian writers on tropical diseases already mentioned. Thus, Annesley devotes a special chapter of his great work to what he calls "hepatic dysentery," a term he applies to cases associated with diseases of the liver, and especially of abscesses, and although he errs in considering that the affection of the bowel is usually secondary to that of the liver, doubtless owing to overlooking to some extent the frequent chronicity and latency of amœbic dysentery. Moreover, several of his coloured plates clearly depict the amœbic type of dysentery, and all but one of these were complicated by liver abscess. His descriptions of the lesions in these cases are also easily recognisable as those due to the amœba dysenterica, although he bases his differentiation of the "hepatic dysentery" on clinical grounds rather than on the pathological lesions found after death. In view of these observations having been published as early as 1828, it is all the more remarkable that the anatomical difference between the two great classes of dysentery have only quite recently become at all generally recognised.

With the separation of amœbic dysentery from the bacillary forms the very lengthy controversy on the exact relationship of tropical abscess of the liver to dysentery has also been nearly set at rest, for the presence of living amœbæ in thirty-five consecutive cases of liver

abscesses in Calcutta in which scrapings from the walls of the cavities were examined by Rogers within twelve days of their being opened, in two-thirds of which the pus was otherwise sterile, appears to be conclusive proof that the amoeba is the cause of tropical abscess of the liver. Moreover, the same observer has shown from a large series of cases that where both a clinical history and *post-mortem* examinations were obtainable, over 90 per cent. of liver abscesses were accompanied by dysentery, which was of the amoebic type in all the cases examined by himself. It is to be hoped that confirmation of these results by equally carefully worked out series of cases from some of the other large hospitals of India will shortly be forthcoming. It should also be mentioned that Dr. McConnel was one of the very first observers to find living amoebæ in the pus from a liver abscess operated on at the Medical College Hospital, and we have been informed that he also recognised the amoebic form of dysentery as distinct from the ordinary bacillary form, although we have not been able to find any account of the differences in his writings. Indian workers have, therefore, contributed in some degree to our knowledge of dysentery as a whole, but much more work is required in different parts of the country before we can be said to possess a sound and complete knowledge of these protean and widespread forms of disease, but with the recent multiplication of bacteriological laboratories,—although they are too often divorced from their natural association with large hospitals—a more rapid advance in this direction may be hoped for in the near future.

AMOEBAE AND THEIR SIGNIFICANCE

THERE has existed for a long time a controversy relative to the etiological significance of the amoebæ in dysentery, and though much has been written about the amoebæ yet very much still remains unknown.

We examined, therefore, with some anticipation of benefit, the recent monograph on "*Amoebas, their cultivation and etologic significance*" by Dr. W. E. Musgrave and M. T. Clegg, of the Government Laboratories in Manila (No. 18, October, 1904).

This monograph not only reviews the previous work of other observers, but sums up strongly in favour of the pathological importance of the amoeba. A large portion of the monograph is

taken up with the experiments of the authors and others on the cultivation of amoebæ.

Amoebæ from water, hay, soil, &c., may be cultivated on a large variety of media, but for the cultivation of those which have passed through the alimentary canal of man and other animals the choice is not so great.

To obtain amoebæ in considerable numbers the patient should be given a saline cathartic, and the examination made from the fluid portion of the stool. Craig has recently succeeded in staining amoebæ, and claims to have been able to confirm the old observation of Dr. D. D. Cunningham, in Calcutta, that the amoeba multiplies by sporulation.

One of the most important points emphasised in the present monograph is the co-operative action of amoebæ and bacteria. This leads to the impossibility of getting pure cultures of amoebæ, because a satisfactory symbiotic living micro-organism is indispensable for the nourishment of these protozoa, and it is found that amoebæ are never free from bacteria except possibly in some bacteria-free liver abscesses, where it is probable that the place of the bacteria is taken by some ferment or enzyme. Not only are living bacteria necessary to the life of amoebæ, but both in the animal economy and under other conditions there is a natural selectiveness on the part of the parasites for certain species of bacteria.

Amoebæ are obtainable from many sources outside the human body, they have been isolated both from surface and deep soil, from the plains and the mountains, from river, lake and sea water, from air, dust, dry grass, hay, fruits, &c., &c. Amoebæ have been found in almost all of the surface waters of the Philippine Islands, and have been grown from every one of hundred samples of water taken from hydrants in different parts of the city of Manila, and cultures from these have produced dysentery in monkeys. Vegetables such as lettuces which are eaten raw contain (in Manila at least) numerous amoebæ. These protozoa have also been found in numerous domestic animals, dogs, pigs, horses, calves, rabbits, frogs and monkeys.

In man amoebæ have been found in ascitic fluid, in the lungs and larynx in tuberculosis, in necrotic abscess of bone, in bloody urine, in the "supposed healthy intestine," and in the dysenteric intestine. The question of the etiological significance of amoebæ is very

important, and our authors who take up a strong point that "all amoebae are, or may become, pathogenic," do not at present attempt to classify the varieties of these parasites

The subject is discussed under the following four headings —

- "1 Amoebas are harmless commensals
- 2 They intensify or alter the lesions already present
- 3 There are pathogenic and non-pathogenic amoebas
- * All amoebas are, or may become, pathogenic

The first of these propositions has had many supporters, from Cunningham in 1881 to Duncan in 1902, the arguments advanced having varied but little. The most important, and the one almost always brought forward, is that amoebas have been found in healthy persons. The evidence of the truth of this assertion is based upon a large number of observations, chiefly those of Grassi (1879), Lewis and Cunningham (1881), during a cholera epidemic in India), Calandrucio, Kruse and Pasquale in Italy, the latter authors finding amoebas in their own normal stools and in those of twenty healthy persons out of a total number of thirty-five examined, Schuberg (1893), who, after the administration of Carlsbad salts, found amoebas in the stools of about ten out of twenty healthy persons, Celli and Fiocca (1895), who isolated amoebas from the intestinal canal of two out of fourteen healthy infants, and from three boys in Alexandria after the use of Carlsbad salts (they also cultivated *Amoeba coli* from the stool of a healthy infant), Fiori (1896), who encountered encysted amoebas in normal stools and motile ones after the administration of salts, Ciechonowski and Nowak (1898) Strong and Musgrave (1900), who found amoebas in 4 per cent of a series of specimens obtained after the administration of Rochelle salts to soldiers not suffering from dysentery or diarrhoea, Huber (1903), who encountered them in about twenty per cent of the cases examined, while, on the other hand, Janowski, Dock, Zorn, and many others have failed to find amoebas in the healthy intestine."

In opposition to the first proposition (to which we have always inclined), Dis Musgrave and Clegg point out that these observations are not conclusive as they state that the maximum period of incubation of the parasites in the intestine may be five months, and the observation of amoebae in the preulceration stage, i.e., in the (apparently) healthy intestine does not prove that subsequently ulceration and illness will not result. However, we may agree with this argument, we cannot deny that it has not yet been demonstrated that these amoebae can persist and proliferate harmlessly in the human intestine for a point beyond the greatest known incubation period of the disease. The authors

then give a number of cases where amoebae were found, but intestinal trouble did not result for many weeks, up to five months after the observation. The following case is quoted —

"The stools of 300 miscellaneous prisoners in Bilibid Prison were examined after the administration of Rochelle salts and amoebas were found in 101 of them. Sixty-one of the positive ones were suffering with dysentery, but the other 40 gave no history of past or present diarrhoea."

During the next two months eight of the latter died of intercurrent diseases, and satisfactory evidence of amoebic infection was present in all. A second examination of the remaining 32 made two months after the first showed 26 positive and 6 negative for amoebas, and 15 of these were suffering from dysentery.

Thus during two months of observation of 40 patients who had amoebas in their stools without symptoms of dysentery, eight died with lesions of the infection, 15 others developed dysentery, and the remaining 17 were released and lost sight of, and in 15 the diagnosis of dysentery was perfectly apparent in all of them."

The next important argument that amoebae are harmless commensals is that they have been found by numerous observers in the intestinal contents of persons suffering with diseases other than dysentery, e.g., D D Cunningham found amoebae in 18 per cent of stools of cholera patients in India, Celli and Fiocca in children, &c, &c. Our authors point out that in most of the cases quoted some disease did affect the colon, and they maintain that further observation would have proved the existence of a double infection, and at any rate it is the *persistency*, not the accidental passage of these parasites through the colon, which has any weight in this question.

The second opinion mentioned above that amoebae are not primarily pathogenic, but may possess the power to alter or intensify the lesions already present is one not without ardent supporters, e.g., these protozoa have been found in ulcers undoubtedly tuberculous. To this our authors have not any other reply than—why not a double infection?

The third view is that there are pathogenic and non-pathogenic amoebae. This is an opinion which has been widely held since the work of Quincke, Roos, Kruse and Pasquale, and an attempt has been made to distinguish between

* It would be of great importance in settling the question if a similar examination were made of the stools of prisoners in Indian Jails for the amoebae. The observations of Grainger, Calvert, Lane, Maddox, Fearnside, &c., have shown the large degree of prevalence of the larger intestinal parasites. Similar observations directed to the amoebae would be of great value.—ED., I. M. G.

the larger species, called *amoeba dysenteriae*, and a smaller species designated *A. coli*. Our authors score a strong point when they point out that the size of an amoeba has little, if any, relation to pathogenesis, and in some of the most persistent and fatal cases of dysentery small amoebae only have been found. Musgrave and Clegg do not deny that there may be pathogenic and non-pathogenic varieties, but they maintain that the existence of such varieties has not been proved.

We therefore come to the fourth opinion mentioned above, which is that of the authors of the monograph under review. We will quote *in extenso* —

"All amoebas are or may become pathogenic. This proposition, pending a complete solution of the problem, is the only safe one to adopt from the standpoint of public health in the tropics. To admit such a proposition adds much to be explained by natural immunity and other conditions. This is especially true in a country where these parasites are found everywhere—in water, in earth, on vegetables, fruits, the skin, &c., and where, at most, an inconsiderable part of the population use any care whatever to avoid ingesting them, and it therefore must be true that they are taken daily into the gastrointestinal tract by large numbers of persons. This being so, if all amoebas are pathogenic, why have we not more amoebic dysentery? And if all are not pathogenic, why do we not find them oftener in the normal intestine?"

We have never followed a case which indicated that non-pathogenic amoebas were propagating in the intestine, and we are sure that such an occurrence is very rare in the Philippine Islands where, as has been said, the larger part of the inhabitants take in thousands of amoebas daily. For we have had no difficulty in cultivating amoebas from the very water they drink, and in producing dysentery in monkeys by the ingestion of cultures from this water under favourable circumstances. If, then, for example, this water contains both harmless and pathogenic amoebas, the number of non-pathogenic ones, capable of resisting the stomach acids and of multiplying permanently in the intestine, are very few in comparison with the number of pathogenic ones capable of resisting the same influences and found associated with the lesions of a pathologic entity."

The following experiments are positive —

Kartulis (1891) asserted that he had produced dysentery in cats by rectal injections of pure cultures of

amoebas isolated from a liver abscess as well as with impure cultures of amoebas obtained from the dysenteric intestine and grown upon the straw-infusion medium. Feeding similar cultures gave no results. Kartulis also produced temporary diarrhoea in two dogs by rectal injections of amoebas grown together with bacteria in sterilized rabbit dung.

Vivaldi (1893) injected cultures of amoebas, which he had grown in straw infusion, into the recta of cats, and diarrhoea followed. At necropsy catarrh of the colon was observed, but there was no evidence of ulceration.

Caesagrandi and Barbagallow (1897) conclude that amoebas which have been grown on artificial media are not paraeitic, because such cultures do not produce the disease in cats.

Zaubitzer failed to obtain pathogenic action with cultures of his straw infusion amoebas. After feeding guinea pigs with these cultures, he was unable to find the parasites in the stools. But when the experiments were repeated in frogs, encysted amoebas were found in the stools and recovered by culture. He thoroughly lavaged the bowels of cats and then introduced cultures and stitched the anus, but obtained negative results.

Fiori fed cultures of the *amoeba coli* of Celli and Fiocca, isolated from the water of Alexandria, to a patient suffering with chronic diarrhoea, which at intervals was dysentery. Amoebas were found in the stools for a few days, but the course of the disease was not altered.

Kartulis finally injected straw infusion cultures of what he considered to be dysenteric amoebas into the rectum of a cat and closed the anus by suture. On the sixth day there were mucous stools. The animal died of dysentery, but no necropsy was performed.

During a fatal epidemic of pneumonia in the Bilibid Prison, Manila, Musgrave and Clegg had many opportunities of observing what they claim to be the very early stages of "amoebiasis," and they are positive as to the existence of a preulcerative stage of the infection. We now quote a few only of the numerous experiments made by our authors —

Monkey No 536 had been under observation in the laboratory for fifteen days, during which time diarrhoea was not present and amoebas were not found in the stool by microscopic examination.

On February 9th, 1904, it was given by stomach tube 10 cubic centimeters of a distilled water emulsion of old encysted cultures of *Amoeba* 11524 in symbiosis with *Spr. cholerae*. No further treatment of any kind was administered, and the animal apparently remained well until the twenty-seventh day after feeding, when a slight diarrhoea was noted. By the thirty-third day this diarrhoea had become very decided, there was considerable mucus, a few red blood cells, and fair numbers of amoebae in the stools. Stained preparations and peptone cultures gave no evidence of the presence of *Spr. cholerae*. From the thirty-third to the thirty-seventh days the diarrhoea abated somewhat, but by the fortieth day it had become a moderate clinical dysentery, which

progressed until the forty seventh, when the animal was killed

At necropsy, which was performed immediately, emaciation and anaemia were marked. The walls of the colon were thickened, the mesocolic glands slightly enlarged, the subserous vessels injected, and the omentum adherent to the caecum. The colon contained fluid material with mucus and blood, and showed a hæmorrhagic catarrh of the mucosa throughout. Ulcers from two to five millimeters in diameter were found scattered throughout the mucous membrane of the colon. These ulcers were rather superficial in character and contained numerous amœbæ, some of which enclosed from one to three red blood cells. Cholera spirilla were not found. The amœbas microscopically resembled those which were fed and were not reclaimed by culture.

A monkey similar to the one above mentioned was fed repeatedly large doses of *Spr. cholerae* of the same stem as that used in the preceding culture by Dr. W. B. Wherry, but without the production of diarrhœa.

Monkey No 442, on October 20th, 1903, was fed 10 cubic centimeters of an emulsion of an old encysted culture of Amœba 11524. On October 22nd, this feeding was repeated. The animal remained well until November 21st, when it was given in the abdominal cavity 5 cubic centimeters of an emulsion similar to that above mentioned. On December 2nd it was injected with 10 cubic centimeters in the abdominal cavity, and on December 21st, 20 cubic centimeters. In the latter part of December there was diarrhœa for a few days. On January 6th diarrhœa again developed, the stools containing mucus, a few red blood cells, and fair numbers of amœbas. By January 22nd the animal had become very much emaciated and anæmic, passing frequent bloody stools, which contained large numbers of amœbas.

On this date chloroform was administered and the necropsy performed immediately. There was marked emaciation and anaemia. The inguinal and mesenteric glands were slightly enlarged. Old chronic peritonitis was evident, the omentum being firmly adherent to the intestines, the surfaces of which also adhered to one another in many places. The large intestine showed hæmorrhagic catarrh throughout. Motile amœbas, some of them containing red blood cells (one of them contained as many as eight), were found in the rectum and the caecum. The walls of the colon were thickened. The solitary follicles were enlarged and capped in places with superficial necroses. There were a few small superficial ulcers, measuring from two to five millimeters in diameter, in the rectum and the caecum. The anatomic picture in general did not differ from that seen in man when death occurs during the early stages of the disease. Amœbas were not obtained in cultures from the colon.

Monkey No 464, on November 18th, was given subcutaneously 4 cubic centimeters of an emulsion of an old encysted culture of amœba 11524, on November 24th, 10 cubic centimeters of a similar emulsion, and on December 7th, 20 cubic centimeters. On December 9th, the abscesses which had formed at the points of the injections, were opened and found to contain numerous amœbas, which grew on culture. On December 12th the serum from this animal showed no parasitocidal action on the

amœbas cultivated from the abscess. On December 21st another subcutaneous injections of 15 cubic centimeters was given. On the 24th diarrhœa developed. From January 1st to 7th the dejecta were dysenteric in character and quite numerous.

On January 12th the animal was chloroformed and necropsy performed at once. Emaciation and anaemia were marked. The large intestine contained a considerable amount of mucus and a small amount of blood, and on microscopic examination showed large motile amœbas. The walls of this bowel were thickened, and the mucous membrane showed hæmorrhagic catarrh. The solitary follicles were slightly swollen, and there were a few small superficial ulcers. Amœbæ were not obtained by culture from the colon. We believe this animal infected itself from the abscess by scratching and licking the wounds and the fingers.

Monkey No 518, after being proved free from infection, on December 29th, 1903, was inoculated subcutaneously with 10 cubic centimeters of an old culture of amœba "water". On January 2nd an abscess formed, and on January 22nd, diarrhœa developed with large motile amœbas in the stools and continued until January 27th, when the animal was killed. Lesions of an early amœbic infection were present.

One of the ulcers six millimeters in diameter, was situated on the ileo cæcal valve, and another one, a little smaller, in the caecum. Amœbas were present in the ulcers and were obtained by culture. As with the two other monkeys already mentioned, it is believed that this animal infected itself from the abscess, a rational explanation to those familiar with the action of these animals under such conditions.

Monkey No 517, on December 29th, was inoculated in the abdominal cavity with 15 centimeters of amœba "water". On January 3rd the abscess which had formed at the point of inoculation ruptured, and its contents were found to contain amœbas. The animal was killed and the intestinal canal was found to be free from amœbas and normal in appearance.

Monkey No 534, on March 24th, 2 cubic centimeters of an old culture of amœba "lettuce" was injected into the liver along with a bacillus from the city water supply. On April 10th the animal was killed. At necropsy the intestine was found to be normal. There were two liver abscesses, the larger one being 10 millimeters in diameter. On section these abscesses had the gross appearance of an amœbic abscess of the human liver. Amœbas and bacteria were obtained by culture from the contents of one of the abscesses.

Monkey No 552, after being proved free from clinical symptoms and amœbas, was inoculated on February 23rd, in the stomach with the aid of a catheter, with 6 cubic centimeters of an old culture of amœba "lettuce". On March 14th, diarrhœa developed, but no amœbas were found. On March 17th, the stools contained considerable mucus and blood, and amœbas were present in large numbers. On March 19th the animal was killed. Necropsy showed hæmorrhagic catarrh of the entire colon, which contained a large amount of bloody mucus in which were found numerous amœbas. There was a general thickening of the walls of the colon, and numerous small superficial ulcers were present.

Monkey No 531 on January 27th, was inoculated subcutaneously with 1 cubic centimeter of a stool containing large numbers of amœbas. An abscess developed. The animal was killed on February 9th. The intestine was found to be normal. The subcutaneous abscess contained amœbæ, which were reclaimed by culture.

Monkey No 357, died from spontaneous diarrhœa on August 30th, 1903. At necropsy there was found to be catarrh of the colon, but no ulceration. No amœbæ were obtained by culture.

Dog No 441, on October 20th, was fed, old encysted cultures of amœba 11524. This treatment was repeated on October 22nd and 26th and November 9th and 11th. There was no diarrhœa, and no amœbæ were found in the stools up to the time. On November 12 the dog was given in the abdominal cavity, 10 cubic centimeters of an emulsion of a similar amœba in melted agar. The animal died on November 24th, of acute general peritonitis. No amœbas and no lesions were present in the colon.

Dog No 553, on January 29th, was given by stomach tube 10 cubic centimeters of an emulsion of an old encysted culture of amœba 11524. There was no diarrhœa, but anorexia, anemia, and emaciation developed early and were progressive until the animal died on March 14th. At necropsy, which was performed ten hours *post mortem*, there was marked catarrh of the entire gastrointestinal canal, but there was no ulceration and no amœbas were found in the contents of the colon.

Cat No 366, on September 4th, was fed 5 cubic centimeters of an old encysted culture of amœba 11147. This treatment was repeated on September 7th, 9th and 15th. The animal remained well until October 19th. On this date and on November 24th additional treatments were administered, but there occurred no symptoms of bowel trouble up to December 4th, when the animal was killed. At necropsy no amœbas were found in the intestinal contents, and no macroscopic lesions were present.

We now quote the conclusions arrived at in valuable monograph—

The term "amœbiæsis," which has been introduced in this article, denoting an infection with amœbas, is comparable in its application to filariæsis, trypanosomiasis, uncinariæsis, etc. It is not open to the objections so frequently offered to "amœbic dysentery," "amœbic enteritis," and the other names usually given to the disease.

Amœbas, when present in water, soil, and other places outside the animal body, may almost constantly be secured in culture, and by the methods described in this paper pure species in pure cultures of bacteria may be obtained. Such pure species of amœbas may be secured by comparatively simple means, and their isolation with pure cultures of bacteria—the "pure mixed culture" of Frosch—by an equally practical technique.

Amœbæ may be cultivated from dysenteric stools and from ulcers in the human bowel. This has been done in 2 per cent of the cases by the direct inoculation of the material containing the amœbas on the surface of the media recommended. Positive results are more frequently obtained (30 per cent) when the media

are simultaneously treated with certain bacteria. They may be grown in a still larger per cent of cases (60) when the media are smeared with the bacteria isolated from the same source as the amœbæ.

Living bacteria or other micro organisms seem to be necessary to the existence of the amœbas under artificial condition.

Amœbas show a certain selectiveness for symbiotic bacteria, and this selectiveness may be increased and changed on artificial media.

The passage of cultivated amœbas through the animal organism, either subcutaneously or by the gastrointestinal canal, increases the selectiveness of the parasite for symbiotic organisms and the difficulty of its growth on artificial media. This phenomenon appears to be progressive with successive animal inoculations, until in some cases the cultivation becomes impossible. If these injections are made into the liver of monkeys, the progressive difficulty of growth increases rapidly with subsequent animals, and the cultivation on artificial media soon becomes impossible with the means at command.

There is as yet no way of determining beforehand what bacteria will furnish satisfactory symbiosis, but the variety of those which may act satisfactorily with amœbas in the human intestine is probably large and includes many of the ordinary and well-known organisms, both pathogenic and non pathogenic. The same one, however, is not satisfactory for all amœbas.

Amœbas have not as yet been grown in pure culture. Whenever they have been freed from other micro organisms by various methods, they have refused to multiply on any known medium.

There are certain differences in the resistance of different cultures of amœbas to certain physical and chemical influences.

The cultivation of pure species of amœbas has offered strong evidence of the plurality of species of these protozoa, and this plurality apparently extends to those which produce infection in man.

The transient appearance of amœbas in the normal intestine is a much rarer occurrence than it is generally believed to be, and their persistence in this location without the production of lesions for a time greater than that of the known latency of some cases of infection has not been shown.

Other evidence brought forward to show the harmlessness of amœbas is not conclusive, and certainly in the tropics the appearance of amœbas in the stools should be sufficiently diagnostic for the institution of therapeutic measures regardless of the nature of the clinical symptoms.

Infection in the colon of monkeys follows the feeding of amœbas under certain described conditions, and such pathogenic ones may be cultivated from a number of sources.

In one instance amœbas cultivated from the dysenteric intestine with a certain bacillus produced clinical amœbiæsis by ingestion in man, while the cultures of this bacillus alone failed to produce such symptoms.

Amœbas are the etiologic factors in the disease generally known as amœbic dysentery, and by following the methods described in this paper, such amœbas may be grown on artificial media, and the disease reproduced in

monkeys and man by the ingestion of these cultures. Amœbas may be reclaimed by culture from the stools or the intestinal ulcers."

THE TREATMENT OF DYSENTERY

TILL the essential causes of the various forms of dysentery are accurately known it will remain impossible to devise and apply exact and rational method of prophylaxis, and even when this ideal state of affairs is reached, there will still remain cases of dysentery to be treated by the physician. We must, therefore, consider methods of treatment, and in order to make treatment fit the case it is necessary to decide what form of dysentery the patient is suffering from.

It is by no means easy to classify all the forms of this protean disease, but for the practical purposes of treatment, we cannot be far wrong in the following classification: (1) Acute cases, (2) chronic cases. Dysentery may also be divided into (1) bacillary, (2) amœbic, and (3) mixed infections. There is also the "terminal dysentery" which is so apt to form the last stage of chronic disease of any kind, and allied to this is the chronic form of ulceration of the colon found in many cases of infection by the Leishman-Donovan bodies. Then, again, there are many cases of acute exacerbations of a chronic state of dysentery, which are not easy at times to be distinguished from acute attacks. This is especially the case in patients treated in the out-patient departments of our hospitals, where frequently the patients are too ignorant to give any accurate history of their previous attacks.

In considering the question of treatment of acute cases, we must first of all call attention to the paramount importance of rest in bed from the very earliest appearance of the symptoms. The out-patient treatment of dysentery can never be successful. Next to this comes suitable food. For Europeans "low diet," thin chicken soup, barley-water, egg-albumen, and the numerous dietetic preparations which have been found useful in typhoid fever. For natives of India and Asiatics generally similar bland unstimulating food is equally necessary. For wheat-eaters rice is useful, for rice-eaters, sago, arrowroot, tapioca, plantain-flour, milk, &c., are indicated. Rice in the form of *mark* (Hindi) is especially of value if cleanly and carefully made.* Soup made from pigeons is also appreciated by high

caste natives of India. In all cases the food must be given in small quantities and frequently repeated.

This low diet will, of itself, do no harm in acute cases, but great care must be taken in chronic cases not to starve the patient. For chronic case milk is of the greatest value, also fresh *bael* in the form of a *sherbet*, sago, arrowroot &c. It must also be noted that the efficacy of both food and drug treatment can only be judged by the daily inspection of the stools. This is a part of the routine treatment of dysentery which must never be neglected. The progress of a case can only be judged by the frequent inspection of the patients' stools.

We may now turn to therapeutics of the disease. In the first place, we may mention the strong *vis medicatrix naturæ* which is seen in almost all cases of dysentery. The tendency is to get well in most cases, hence the success of numerous drugs when tested on a mild run of cases. We have ourselves treated a series of 20 mild cases of dysentery with no more powerful drug than aqua menthæ pipentæ, and they all recovered in from seven to ten days, owing to rest in bed and careful dieting. We mention this at the outset merely by way of warning, as every new method of treatment seems successful in the hands of the man who first uses it.

In these bacteriological days, we must give the first place to a brief consideration of the serum treatment. It is well known that the Japanese observer Shiga obtained what is claimed to be a powerful antidysenteric serum by immunising horses against the bacillus he called *b. dysentericæ*. Shiga claims as a result of 500 trials of this serum that patients in the early stages were rapidly cured or their condition markedly improved. In more advanced stages he claims that the number of the stools are diminished and a cure follows in three or four days. He also points out that the prognosis depends upon that site of the ulceration, the most favourable prognosis can be given when the sigmoid and rectum are attacked, and the higher up the bowel the inflammation has gone the worse the prognosis.

Apart from the fallacy that mild cases of dysentery are cured by rest in bed and suitable diet, it is unfortunate that infection by one type of the *b. dysentericæ* is not amenable to treatment by the antitoxin from another, hence reports of the value of the serum therapy in Japan will not be borne out in, say Manila, and we have heard nothing good of the (few)

* See writer's article *British Medical Journal*, 10th Feb., 1900, p. 306.

attempts to treat Indian dysentery with antitoxic serums Till, therefore, much more is known of the varieties of the bacillary infection in each country little can be expected from the serums derived from cases in another country It may, therefore, well be that the alkaline bacillus of Shiga can be counteracted by an antitoxin derived from it, and in a similar way from the acid bacillus of Manila dysentery a successful antitoxic serum can be produced, but both may be useless in India, or either may be useful, and this can only be known when much more attention has been paid to bacillary dysentery in India We now turn to the treatment of dysentery by drugs, and in point of traditional repute the first place must be given to ipecacuanha

This drug though introduced in the middle of the 17th century from Brazil chiefly owes its great reputation to surgeons in India

Up till a dozen years ago the drug treatment of dysentery was summed up in the one word ipecacuanha, and no one who watched its effects and saw the marvellous change in the nature of the stools after one dose of ipecacuanha could help believing in its efficacy, of course we mean its use in large doses of 30 to 60 grains, not in the trifling doses it is sometimes prescribed in hospitals in England This method introduced by Dock, Surgeon to the 5th Fusiliers, in 1858, has of recent years become less fashionable It is not easy to say why Its tendency to produce nausea and vomiting is of course against it, and this led to the introduction of a de-emeticised ipecacuanha by Lt-Col G A Harris, I.M.S., now Professor of Materia Medica in the Calcutta Medical College, but this form of ipecacuanha though written of favourably by Tull-Walsh, A. Caddy and Kanthack has scarcely stood the test of time and is now but little used

Davidson has said of ipecacuanha (Allbutt, vol II, p 435) that "the treatment by large doses has been so successful that it should not rightly set aside in favour of any other" Yet undoubtedly ipecacuanha is nowadays much less used even in India than it used to be This may be due to the knowledge that many mild cases of dysentery are amenable to drugs with lesser drawbacks It is a fact that in the United States, the Philippines and in Cuba ipecacuanha has been found of no use, and this may be explained by the supposition that (as appears to be the case) the dysentery of these countries is chiefly amebic, or it may be that ipecacuanha has some specific action on the variety of

bacillus that produce ordinary Indian dysentery We need hardly mention the use of *madar* (*calotropis gigantea*) which used to be recommended as a substitute for ipecacuanha

The treatment of dysentery by aperients—These are calomel, castor oil, and the saline sulphates of soda or magnesia

As to calomel, it was first used with success by French physicians in Algiers and introduced into India we believe by Annesley We know of several medical men who use this drug regularly and with good effect It has been used in large doses (5 to 7 grains) every five or six hours or in smaller doses of one grain more frequently Fractional doses have been found of use in the dysentery of children It is very frequently prescribed in combination with other drugs as ipecacuanha and opium, or as by Kautels in half grain doses with 5 grains of naphthalin ten or twelve times in the 24 hours

Castor oil—This is a very valuable drug in the treatment of dysentery, and in the form of Birch's castor oil emulsion is much used, and is of especial value in the dysentery of children The old Indian practice of a preliminary dose of half an ounce of castor oil with 10 minims of laudanum is of great value, and should, we think, precede any other form of drug treatment except perhaps the saline

The Salines—The saline treatment of dysentery was also introduced by French physicians, and of recent years has become very popular in India Several years ago their use was advocated by Tull-Walsh and Leahy in India, and more recently by the present editor of this Gazette Wyatt-Smith considered the salines almost as specific in the dysentery of Brazil The latest article on the saline treatment of dysentery by W J Buchanan* gives the following results—It is based upon the use of sulphate of soda in drachm doses in 1,130 consecutive cases of dysentery among prisoners with only nine deaths or a death-rate of considerably under one per cent

For acute cases of dysentery we know of no drug which acts so rapidly, so painlessly or so effectually It is recommended to give this drug in drachm doses in either fennel or cinnamon water, four, five or six times a day till bright yellow soft, feculent stools are produced without a trace of blood or mucus It is not recommended in chronic cases, where ulceration

* *British Medical Journal*, September 20th, 1902

is known or suspected to be present, but it may be given in a careful manner during acute exacerbations of the chronic state. We believe that the use of sulphate of soda combined with rest in bed and low diet is the most useful routine treatment for commencing case of acute dysentery. We do not recommend it for out-patient practice, because it is not easy to know the state of the inflammation in the patient's bowel and it is not possible to properly watch the stools, but where patients can be promptly admitted to hospital on the first occurrence of symptoms we know of no drug so useful in acute dysentery.

Treatment by intestinal antiseptics—The drugs used in this method of treating dysentery are many, but attention has been chiefly directed to the use of salol, bismuth, perchloride of mercury, sulphur, betanaphol, izal, and other modern "intestinal antiseptics." Salol has been recommended by Kartulis and Rasch in 15 to 20 grain doses, either alone or in emulsion with castor oil and gum acacia. Bismuth is much used as a routine treatment, and is supposed to be of value in chronic dysentery. It is probably useless in the acute form. The salts of bismuth are insoluble in the intestinal canal, and any effect they could have would be merely mechanical. At autopsies we have seen the edges of ulcers impregnated with bismuth, but only with the effect of hardening them, and possibly preventing their healing.

Perchloride of mercury in combination with cannabis indica enjoyed at one time a great reputation in India, and is still prescribed, though beyond the possibility of its being what is vaguely called "an intestinal antiseptic," it is not clear how it can be of use. Newer drugs such as betanaphol, naphthalin, acetozone, alphonzone have also had their advocates, and they may be of use in getting rid of amœbæ in cases of that form of dysentery.

The use of izal, however, stands upon somewhat different footing, in India at least, where owing to the powerful advocacy of Major J C S Vaughan, I.M.S.,* it is being tried by many medical men. Vaughan showed that, according to the researches of Tuncliffe, the doses required to produce toxic symptoms are far in excess of those required to produce the ordinary therapeutic effects of izal. He found as many others have done that izal in 3 minim doses, as first recommended, is quite useless and he pushed the

izal, and now recommends it in 15 or 25 minim doses, that is, doses of from 15 to 25 minims six or seven times a day. The drug can be made up with chloric ether, camomom and glycerine or with spirits of chloroform, and peppermint, &c., or it may be given in milk.

The treatment by enemata—There can be no doubt that there is much to be said in favour of the treatment of dysentery by enemata, unfortunately, however, this is not a popular method of treatment with natives of India.

All sorts of astringents and antiseptics have been used. Nitrate of silver has much in its favour, iodoform and olive oil have advocates. All these remedies may be of use in chronic dysentery, but are not much use in acute dysentery except in the amœbic form, as powerfully advocated by Musgrave of Manila.

We may sum up the drug treatment of dysentery by saying that there are many equally good methods of treatment for acute cases, but there is no royal road to the treatment of chronic dysentery, in which infinite patience on the part of both physician and patient is required.

We have not said anything about the local treatment of this disease, such as fomentations, leeches to anus, &c., &c., such remedies are, however, applied on general principles.

On recovery from an acute or chronic attack of dysentery, the greatest care is necessary. The diet should only gradually return to the ordinary, and it should always be remembered that relapses are frequent, and for years after a patient needs to take the greatest care of himself. Change of scene is of the greatest advantage where it can be taken, and European patients are recommended to go on leave after recovery and to try Helouan, Carlsbad, or other similar health resorts.

A DYSENTERY TOXIN AND ANTITOXIN

DR CHARLES TODD, of the Lister Institute, has published (*Journal of Hygiene*, Vol 4, No. 4, October 1904) a valuable paper on a dysentery toxin and antitoxin. His paper refers altogether to bacterial dysentery. In this form he states that "bacilli are found regularly in the mesenteric glands, but are not found in the spleen or other organs, nor in the blood, urine or milk." It is not, therefore, a septicæmic disease like typhoid, but must be regarded "as a local

* I.M.G., October, 1904

infection of the intestinal mucous membrane and corresponding lymphatic glands by the bacillus, the toxin alone passing into the circulation and giving rise to the typical clinical picture, which as in the case of cholera, gives the impression of a severe poisoning or toxæmia

In Dr Todd's experiments the following bacilli were used —

(1) B dysentericæ	Shiga
(2) "	Kruse.
(3) "	} Flexner, Philippines
(4) "	
(5) "	} Duval, Summer Diarrhoea, Baltimore
(6) "	
(7) "	} Eyre, Asylum Dysentery, England
(8) "	
(9) "	

Dr Todd sums up his conclusions from the experiments as follows —

1 Old cultures of B dysentericæ, Kruse, in somewhat highly alkaline broth contain a soluble toxin

2 The same toxin is also contained in the bodies of the young bacilli

3 The horse and rabbit are very highly susceptible to this toxin, the guinea-pig, rat and mouse being very resistant

4 Immunisation of the horse, either with the soluble toxin from old alkaline broth cultures or with the bodies of the young bacillus, gives rise to an antitoxin

5 The antitoxic power of the serum of horses so immunised may reach a very high value in the case of an animal immunised with the bacillus, one-thousandth of a cubic centimetre of the serum being sufficient to protect a small rabbit against twenty minimal lethal doses of the toxin

6 The antitoxin is capable of protecting animals, either when mixed with toxin or when given separately at another part of the body, either at the same time or shortly before or after the toxin

7 The toxin and antitoxin require a certain time for their combination in vitro, and this time is dependent upon the temperature, varying from less than 5 minutes at 37°C to between one and two hours at 0°C

8 Shiga's dysentery bacillus, and three strains of a bacillus isolated from cases of asylum dysentery in England by Eyre were found to yield a similar toxin, and this toxin was neutralised by the antitoxin prepared by means of the toxin from Kruse's bacillus. A strong point in favour of the identity of the above bacilli

9 Attempts to obtain a soluble toxin from B dysentery Flexner (adult dysentery, Philippines), and from two races of the bacillus isolated from cases of summer diarrhoea by Duval in Baltimore and New York were unsuccessful

It is very much to be desired that bacteriologists should settle the question of the identity of the different bacilli found in dysentery, at present the bacteriology of this protean disease is like that of pneumonia, and it is probably that they are both multiple infections with identical clinical symptoms

AMŒBIC DYSENTERY IN INDIA

THE most valuable work published of recent years on the subject of amœbic dysentery in India is contained in the paper by Major Leonard Rogers, I.M.S., F.R.C.P., in the *British Medical Journal* (June 6th, 1903). We quote the following extracts from this paper —

THE VALUE OF THE SERUM TEST IN DIFFERENTIATING THE BACILLARY FROM THE AMŒBIC TYPE OF DYSENTERY

The recognition in India of the amœbic form of dysentery and of its intimate relationship to liver abscess naturally suggests the use of the serum test in order to differentiate the common bacillary form of dysentery, which is not in my experience ever followed by the large tropical form of liver abscess, from the amœbic disease with its many and serious complications and frequently chronic and at times latent course. As cases of severe dysentery are comparatively seldom admitted to the Medical College Hospital, except when occurring in European patients, necropsies on uncomplicated cases of this disease are not very frequently obtained. Nevertheless, I have been able to make bacteriological examinations after death in a few cases, and have usually succeeded in isolating organisms which grow in the depths of a glucose agar culture without the production of any gas bubbles, and in one case, also, obtained a similar culture from the spleen. In other respects these bacilli closely resembled that described by Shiga as the cause of dysentery in Japan, while Flexner, in America, and other observers have also confirmed Shiga's original observations on the etiology of this disease. It seemed advisable, therefore, to test the serum reactions of a series of cases of dysentery with different strains of dysentery bacilli, including that isolated by myself, in order to see if this bacillary form of the disease could be differentiated clinically by this means, as the amœbic type is said not to react with the dysentery bacillus. For this purpose I obtained bloods from dysentery patients in the Campbell and Police Hospitals, through the kindness of Major Vaughan, I.M.S., who was in charge of these institutions at the time. The results have appeared in the *Indian Medical Gazette* for February, 1903, so they need only be summarized here. In all, 17 cases were tested with both

Shiga's and my own bacilli, and all but one reacted with one or the other, and eleven of them with both. Two gave reaction with Shiga's and not with my organism, and three others reacted with mine and not with Shiga's. In four of the cases which reacted necropsies were subsequently obtained, and in each of them the ordinary bacillary type of dysentery was found, and in three of them cultures were made, and organisms growing like Shiga's bacillus in glucose agar were isolated, although it is often necessary to inoculate a number of tubes in order to get a positive result. In none of these cases was anything resembling amœbic dysentery found *post mortem*. On the other hand, in the remaining cases which gave no reaction very numerous active amœbæ were found in the fresh stools during life, and typical amœbic dysentery was found after death with many active amœbæ in the floors of the ulcers. Thus the only case of the whole series which failed to give any reaction proved to be one of amœbic dysentery. In six of the cases a bacillus obtained from Europe as that of Flexner was tried, but with entirely negative results, and similarly six cases were tested with an organism obtained as Krause's dysentery bacillus, also without any positive result having been obtained. Possibly the dysenteries met with in America may differ slightly from those of India, or the organisms sent me as Flexner's may not have been correct.

The above results are certainly suggestive, although the number of cases tested is too small to base any very definite conclusions on, and it is only the fact that the severance of my temporary charge of the Medical College Laboratory prevents my pursuing the subject for the present that seems to warrant my placing them on record for the guidance of others who may be working at the subject. It is, however, of interest to note that all, except one amœbic case, gave reactions indicating that they were of the bacillary type of dysentery, as this supports the conclusions which I have arrived at from the study of the Medical College cases, namely, that the common type of dysentery in the tropics in India is that due to Shiga's bacillus, while the amœbic type, which is complicated with liver abscess in so large a proportion of the cases, is much rarer, and its synonym of "tropical dysentery" is a misnomer. Should these observations be confirmed by the examination of a larger series of cases, then the serum test will prove of as great value in the differentiation of the varieties of dysentery as it already has been in helping to clear up the classification of the fevers met with in tropical India.

SUMMARY AND CONCLUSION

1 Amœbic dysentery is most frequently found in patients dying from large tropical liver abscess, in the walls of which I have previously shown amœbæ can always be found unless they have been opened for some time. The disease is chronic, and often latent, and not often very fatal by itself, but usually through complications.

2 Amœbic dysentery has naked eye and microscopical characters which enable it to be easily distinguished from the more common bacillary type of the disease.

3 Its most important complications are large abscess of the liver, chronic or acute peritonitis, and post peritoneal abscess.

4 Amœbic abscess of the liver secondary to this form of dysentery may be produced (1) by infection across the peritoneum, with or without previous adhesions, or (2) through infection by the portal vein producing sufficient clotting in its branches to cause a focal necrosis in one or more parts of the liver, concentric extension taking place by means of a similar process.

5 If staphylococci reach the liver with the amœbæ, as especially occurs when gangrenous elongating of the bowel wall complicates amœbic dysentery, then multiple small abscesses in the interlobular branches of the portal vein containing both amœbæ and staphylococci result.

6 The bacillary form of dysentery is much commoner in Calcutta than the amœbic one, and is due to Shiga's bacillus, which is clumped by the blood of cases of ordinary dysentery, although not by that of the amœbic form, thus furnishing a method of differentiation between them clinically.

NOTES

MAJOR VAUGHAN, I.M.S. (*Indian Medical Gazette*, 1904) strongly advocates the employment of Izal in tropical dysentery as the most reliable remedy if administered in full doses. He suggests three standards of dosage averaging 10½, 15, and 26½ minims of izal emulsion, respectively, the last two being the most serviceable. Doses are given every three hours while awake from 6 A.M. to 9 P.M. and usually a seventh dose at about midnight.

DR. F. M. HARSTOCK (U.S. Army) in a description in the *N. Y. and Phila. Medical Journal* (July 1904) of the three types of dysentery met with in Tropical Islands, viz., the catarrhal, the amœbic, and the acute or specific, states that the worst cases of the specific type occur in the Philippines, and particularly in the island of Luzon. He considers this type to be the most directly dangerous affection of the intestinal canal excepting cholera. According to him, the blood serum always agglutinates a pure culture of Shiga bacillus.

ROSENTHAL (*Deuts. Med. Woch.*, May 1904) states that the serum of horses immunized by cultures and toxin of dysenteric bacilli is both bactericidal and antitoxic. Of one hundred and fifty-seven cases treated by him only eight died in the hospital, and three outside from other diseases. While finding the best results among cases taken in hand in the earliest stages, he noticed an amelioration of symptoms in all cases, and that very few passed into the chronic stage. He considers that the treatment promises a reduction of the mortality by one half. From earlier experiments made with rabbits and guinea pigs, he concluded that the serum of these animals when immunized possessed prophylactic as well as curative properties.

PROFESSOR TANNER HEWLETT reproduces in "Treatment" (February 1905) results which Gay and Duval have published (University of Pennsylvania Medical Bulletin) of some preliminary experiments carried out with a view to ascertaining whether both the acid-producing (of Strong, Flexner, Kruee, &c.) and the non acid producing (of Shiga, Duval, Müller, &c.) strains of the *Bacillus Dysenteriae* can both occur together in individual cases. They secured a number of colonies

from each of three cases and tested all of these upon mannite, with the result that the colonies in two of the three cases exhibited both strains. Dealing in the same organ, with certain aspects of the disputed questions regarding whether more than one species of dysentery bacillus are to be recognized, whether the clinical manifestations vary with the nature of the provoking organisms, &c., Gay offers the following conclusions—

(1) Dysenteric bacilli (Shiga) fall into two types according to certain cultural and agglutinating reactions

(2) These reactions are not absolute but relative, and serve to give the bacilli the characters of a closely related group of organisms

(3) Bacteriolytic differences serve to distinguish the two types of dysentery bacilli now recognized as sharply as the other tests hitherto employed

(4) The relative value of the distinctions is emphasized by the protective power of anti-dysenteric serum, which is effective in different doses for both types of the micro organism

(5) Human complement is capable of activating anti-dysenteric serum from the horse

(6) Passive immunity to the dysentery bacillus is of brief, active immunity of much longer duration in the guinea pig

(7) Dysentery bacillus vaccines increase in toxicity for a time at least, and the increase is associated with disintegrative changes in the bacilli

DR REMEINGKR, writing in *La Press Medicale* (September 1904) upon the association of dysenteric anasarca and the retention of chlorides, suggests that the over administration of sulphate of soda probably acts as an important factor in bringing about the retention of chlorides, and he thinks that it would be a wise precaution to somewhat limit its routine administration

SOME experiments have been made by Jordan Russell and Zeit (*vide* note by Professor Fanner Hewett in *Journal of State Medicine*, March 1905), regarding the probable duration of vitality of the Shiga bacillus in natural waters. They suspended sacs of collodion and parchment filled with the natural waters and the bacilli in various waters, *e g*, tap water, streams, &c., and tested these at short intervals for the presence of the bacilli. They concluded that, under conditions closely simulating nature, the vast majority of the bacilli introduced perish within three to four days, that possibly specially resistant cells may withstand for a longer period the hostile influences in such waters, but that they do not claim that such behaviour is necessarily representative of what would actually happen in nature

Correspondence

SLING FOR THE ARM

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—May I draw attention to a substitute for the ordinary triangular sling for use in minor injuries, &c., of the arm, it is especially useful in the hot weather as it is light and cool.

It consists of a 1½ inch wide black silk tape or band about 8 feet long with the ends sewn together, the middle of this double band is placed behind the neck with the ends in front, and it is in the loops of the latter that the affected forearm is placed. The width and length of the band can be altered to suit each individual case.

I must say that the credit of this suggestion is not mine, but due to Mrs Walker, the wife of Major Walker, 100th Infantry

Yours faithfully,

AHMEDABAD,
23rd May, 1905

W H COX,
CAPT, I M S

ANTIQUITY OF VACCINATION IN INDIA

To the Editor of "THE BRITISH MEDICAL JOURNAL"

SIR—With reference to my letter to you dated 11th May, it is right that I should inform you that, after its despatch, I ascertained that I could not justly claim that Rajah Sir Radakant Deb Bahadur personally admitted the disputed quotation into his "Sapthakalpadruma," as the revised edition of this work in which it is to be found was published after his death long subsequent to the first appearance in the *Madras Courier*. This in no way invalidates my other arguments or, indeed, greatly even in this particular, as the compilers of the later revised edition are also recognized Sanscrit authorities.

Yours, etc.,

MADRAS,
25th May, 1905

W G KING,
LIEUT COL., I M S

[The above letter has been sent by Lt. Col King to B M J]

REMOVAL OF LARGE STONES IN BLADDER

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Captain H A Williams, D.S.O., I.M.S., Resident Medical Officer, General Hospital, Rangoon, has just forwaded me the final result of a case of stone in the bladder operated on by me in February. He has at the same time called my attention to the report in the *B M J* of January 7th by Mr Pike of St Vincent, of the successful removal entire of a stone weighing 13½ ozs, to a note by Lieutenant-Colonel Hatch, I.M.S. (Retired), of a stone removed entire by him weighing 17 ozs (result not stated), and to a note by Major T Hudson, I.M.S., in the *B M J* of March 18th, of a fatal case of stone weighing about 20 ozs removed after bisection.

My case was that of a Burman cultivator aged 37, who had suffered for 15 years from symptoms of stone in the bladder. His general condition was, however, surprisingly good, although there was constant dribbling of urine which was intensely foetid. Litholapaxy being found impossible on account of the size of the stone and the way in which it filled the bladder, suprapubic cystotomy was performed, and the stone was then crushed with great difficulty by a lithotrite introduced through the suprapubic wound. The operations occupied two hours and was extremely tiring. The fragments of the stone when dry weighed 13 ozs 6 drs. Its central part was extremely hard, and was surrounded by softer white concentric laminae, fragments of the outer giving a good idea of its size. The wound was left open. The patient had no bad symptoms, and was discharged with his wound treated just a month after. I am indebted to Captain Williams for assistance during the operation for the after treatment and for the notes of the case.

The most important point in connection with these large stones would seem to be the best means of removal. Removal entire is the most expeditious way, but this means a very large incision into the bladder with the danger of opening the peritoneum, and the exercise of perhaps a dangerous amount of force. Removal by crushing means a prolonged operation in a patient generally greatly debilitated, and a considerable amount of injury to the mucous membrane of the bladder. I have no experience of perineal litholapaxy and its applicability to these cases.

Yours, &c.,

C DUER, M.B., F.R.C.S.,
MAJOR, I M S

[Opinions invited.—ED., I M G.]

A CASE OF INTESTINAL OBSTRUCTION

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—Bilal Dhunub, 35, M.m., was brought in the Raj Hospital, Durbhanga, on the 4th April 1905, with symptoms of obstruction of the bowels.

He joined a feast three days before admission, where he indulged freely with meat, bread, &c. Next day he had diarrhoea and vomiting and was treated by village hakims. The purging and vomiting ceased, but obstinate hiccup continued.

Abdomen tympanitic, urine free, bowels costive, no passing of flatus, pulse good, temperature normal, vomiting of watery character continue, eyes sunken and patient restless. Soap water enema, opium and belladonna pills and turpentine given.

5th April — Condition about the same could not retain any food, pain less the same treatment continued.

6th April — Vomiting and hiccup less, tympanitis diminished. Could retain a little milk. Treatment as before.

7th April — Passed urine freely several times abdomen much relaxed.

8th April — Had one stool of soft yellowish character after the enema. Tympanitis and pain much less. Effervescent mixture given.

9th April — Bowels moved freely. The stools contained a lump of round worms about 9 or 10 in number. Hiccup less. A dose of santonine was given.

Condition improved gradually. No more worms were passed. Appetite improved and regained strength gradually. He was discharged cured on the 15th April 1905.

Remarks — The cause of the obstruction might have been the impaction of the ball of round worms, which is rarely met with.

DURBHANGA, }
26th May, 1905

K P LABIRI,
Asst Surgeon

THERAPEUTIC NOTES

OUR attention has been directed to the mass of literature on the use of CYLLIN as an intestinal disinfectant. This valuable disinfectant was formerly known as orcolin, but owing to inferior preparations being sold under that name, the Jeyes' Sanitary Compounds Company, Ltd., of Cannon Street, London, E.C., have introduced the name Cyllin. This disinfectant has the enormous advantage of being non-poisonous. Its carbolic acid co-efficient is very high being no less than 11, lysol being 2.5, and 8.0 and carbolic acid 1.0. According to certain experiments made by W. J. Simpson and R. T. Hewlett at the Laboratory, King's College, London, while the "carbolic co-efficient" of formalin for the plague bacillus averages 0.3, that of cyllin averages no less than 340, and for the B. dysenteriae of Flexner, the co-efficient of cyllin according to Dr. David Sommerville is 10.

There are two kinds of cyllin, one cyllin (disinfectant) and the other cyllin (medical). The disinfectant cyllin is supplied in a concentrated form, and used in a 1 in 400 dilution. The medical cyllin is supplied in the form of PALATINOIDS (prepared for the Jeyes' Company by Messrs. Oppenheimer, Son & Co., Ltd.).

These palatinoids have been used with great success in many inflammatory intestinal conditions. Dr. W. Hartigan has used them with great success in sprue, and other medical men have reported on their value in mucous colitis, troublesome diarrhoea, and in enteric fever. We are of opinion that they might well prove of great value in cases of chronic dysentery, a form of this complaint which has hitherto proved little amenable to drug treatment.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

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BOOKS, REPORTS, &c., RECEIVED —

Laryngeal Phthisis by Lake and Barwell. (2nd Ed.)
Verb-Sap. By A. Field. Bale Sons and Danielson.
Sir Wm. Bennett. Effusion into Knee-joints. (Longmans)
Character of Drugs, Bonnar. (Sanyal & Co.).

Mucous Membranes and Malignancy. Balliere, Tindall & Cox.
Modern Diatetics and Disease, Sims. Balliere, Tindall & Cox.
Rolloston on Liver. W. B. Saunders & Co.
Moynihan on Gallstones. W. B. Saunders & Co.
Draper on Legal Medicine. W. B. Saunders & Co.
Atlas of Pathologic Histology. W. B. Saunders & Co.
Friedenwald and Rubrah on Diet. W. B. Saunders & Co.
Pylo's Personal Hygiene. W. B. Saunders & Co.
W. J. Simpson. Rules for the Tropics. J. Bale Sons and Danielson.
The Hongkong Medical Report.
Rajputana Medical Report.
Central India Medical Report.
Bombay Asylums Report.

LETTERS, COMMUNICATIONS, &c., RECEIVED FROM —

Major Henry Smith, I.M.S., Jullundur, Lt.-Col. Crawford, I.M.S., Hughli, Capt. Lee Abbott, I.M.S., Capt. Windsor, I.M.S., Major E. Jennings, I.M.S., Major W. Jennings, Bombay, Lieut. Mackie, I.M.S., Capt. Mathews, I.M.S., Capt. D. McCay, I.M.S., Lt. Col. G. Harris, I.M.S., Major E. Roberts, I.M.S., Capt. S. P. James, I.M.S., Major L. Rogers, I.M.S., Capt. Patton, I.M.S., Lieut. Christophor, I.M.S., Lt. Col. King, I.M.S., Capt. C. Donovan, I.M.S., Lt. Norman White, I.M.S.

EXTRACTS

ANOTHER MEMBER OF THE DYENTERY GROUP — Duval (*Journal of the American Medical Association*, 1904, vol. xliii p. 381) describes an organism of the dysentery group, isolated from a fatal case of dysentery occurring in an adult, which differs in some respects from all hitherto described strains. The organism closely resembles the Flexner-Harrie strain of bacillus dysenteriae, but differs from it in its action on lactose and litmus milk. Its agglutinative properties also tend to distinguish it.

In neutral litmus milk the initial acidity is gradually lost to that in three or four days the milk regains its original blue color. This remains for four to six days, when a permanent acid reaction occurs. The agglutination reactions show that the bacillus is in all probability closely allied to bacillus typhosus. It is agglutinated by the blood of typhoid patients in high dilution and also with the blood of rabbits immunized against bacillus typhosus. Likewise, bacillus typhosus is agglutinated by the blood of rabbits immunized against this organism. The organism appears, therefore, to produce common agglutinine with the typhoid bacillus, but its close cultural resemblance to the bacillus dysenteriae group serves to classify it with them.

THE SPIROCHÆTA OF SYPHILIS

THE spirochæta which Schaudinn and Hofmann have recently reported as found constantly in syphilitic glandular lesions has been found by Metchnikoff in 4 out of 6 monkeys that had been successfully inoculated with syphilis. He also found it in 4 out of 6 syphilitic young men, and was unable to detect it in other cutaneous lesions examined. Bordet and Gengon found a spirochæta in a syphilitic chancre and in throat lesions, as long ago as 1902, but did not venture to ascribe etiologic importance to it. Schaudinn and Hofmann were able to distinguish two varieties in the syphilitic lesions, one with sharper coils, more like those of a corkscrew, which they call the *S. pallida*. The other is larger, takes the stains better and its coil is more undulating. It is difficult to stain the *S. pallida* and it has thus far proved impossible to cultivate. It varies from 4 to 14 microns in length, while it is less than 25 micron in diameter, with 6 to 14 turns in its spiral. Their article is published in the *Deutsche med. Wochschr.*, May 4, while Metchnikoff's communication on the subject was presented to the Paris Académie de Médecine, May 16. Buschke has since reported the finding of the same *Spirilla pallida* in large numbers in the spleen and liver of a four months' babe with inherited lues. Schaudinn and Hofmann's report was based on 8 cases.

Original Articles.

THE TREATMENT OF FRACTURES

BY F W SUMNER, B.A., M.B. (CANTAB.), F.R.C.S.,
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THE object of this paper is to enquire more closely into the pathological changes which take place during the healing of a fracture with a view to a more rational treatment of cases of fracture

Pathology—The fractured ends of the bone, at the time of the injury producing the fracture tear the periosteum and lacerate the adjacent muscles (in rare cases they may also damage vessels or nerves)

In cases of fracture by direct violence there is in addition contusion of the soft parts this increases the amount and extent of the inflammatory material poured out from the vessels there is also decreased vitality of the soft part

At first blood is poured out from the torn vessels of the bone, periosteum, and muscles then the earlier stages of inflammation set in with the pouring out of coagulable lymph this penetrates into and among all surrounding tissues, and thus the limb becomes swollen

As the swelling increases so compression of the vessels in the bone muscles, etc., occurs, especially of the smaller veins this dams back the blood in the capillaries, leads to a larger pouring out of serum into the tissues and to still greater swelling

Finally the stage is reached where the limb is cedematous, the skin shining, stretched and discoloured and pitting on pressure the circulation through the part is very poor

The severity of these pathological changes will of course depend on the amount of displacement of the fragment, and hence tearing of the soft parts and also on the intensity of the contusion

From the first the slightest movement of the limb causes acute pain both torn and untorn muscles are in a state of inflammation tender to the touch and almost incapable of any contraction at all, and that causing considerable pain hence the patient is at considerable trouble to keep the limb absolutely at rest for the first few days at any rate

If the part is placed in splints and kept at rest, the swelling and inflammation subside sooner or later, but the coagulable lymph organises, becomes young fibrous tissue and causes the matting together of surrounding parts thus the muscles become stiff and tied down with adhesions

Hence when the bone is firmly united and the splints discarded, any attempt to bring the muscles into action, pulls on the adhesions, causes pain and probably sets up slight inflam-

mation and swelling hence a second period of treatment, often prolonged is required for the breaking down and absorption of these adhesions, and for the recovery by the muscles of their tone, contractility and normal size

Principles of treatment in fractures may be deduced from the above as follows.—

1 To obtain sound fusion of the fractured bone or bones in the best position attainable

2 To keep up the tone, contractility and nutrition of the muscles pending the healing of the bone, so that the moment the bone is strong enough to stand strain the muscles are ready for work

3 To prevent the formation of adhesions of muscles, tendons or joint surfaces

4 To promote absorption of effused blood and lymph

Old method of Treatment—Consisted of—

(1) 'Setting' the fracture

(2) Immobilisation of the part in some apparatus

(3) Keeping at absolute rest in this apparatus until a certain period of time (from three to seven weeks according to the site of the fracture) has elapsed, when experience shews that the broken bone ought to be firmly united

(4) Taking off the fixation apparatus and encouraging the patient to use the limb In this treatment the main idea is to get the bones into good position, fix, and keep thus fixed until they have joined The damaged soft parts, the effused blood, the inflammatory products are all left to look after themselves, with the result that the various changes and their results noticed under heading 'Pathology,' occur.

Results—1 The bone is united, but the juncture may be frail and may give way because of the absence of muscular tone preventing the muscles taking off excessive strain when the limb is again used

2 The muscles, tendons, etc., surrounding the site of the break are stuck together by organised lymph which has formed fibrous adhesions when the muscles are put into action, they pull on these adhesions and set up pain, inflammation and swelling, with resultant diminished functions of the part, if not complete loss of function

3 The muscles of the limb are also atrophied from disuse and are of greatly diminished tone

4 Many days, weeks or months are required before the limb is in full working order again It is this class of case which goes to provide the so-called 'bone-setter' with the larger portion of his practice adhesions between muscles, etc., stretched set up repeated inflammations, he treats them by sudden movements which causes them to snap with a twang and cures the patient, his explanation of the phenomenon is that 'a small dislocated bone' was reduced when the snap took place

Treatment by fixation and massage—This is a great advance on the old method and is the

method generally in vogue in London hospitals at the present day

It consists of—

- (1) Setting the fracture
- (2) Applying some fixation apparatus
- (3) Daily removing this in part and massaging the part

(4) Later on when the bone is united passive movements are commenced

Of the four 'principles of treatment' above-mentioned numbers 1, 3, 4 are fulfilled, but not No 2

* *Treatment by massage and voluntary movements of the muscles with a minimum of fixation*—Consists of—

- (1) Massaging the part at once directly the case is brought under treatment

Result—Removal of effused blood

- (2) Bringing the fragments into apposition and applying overlapping strips of plaster round the limb sufficiently long for the ends to cross and sufficient in number to enclose the region of the fracture with some four inches of limb above and below

The plaster is ordinary adhesive linen strapping and must be simply laid flush with the surface of the skin but not drawn tight

Result—The elastic skin, allowing swelling in the tissues beneath, is fortified by a pliable inelastic closely fitting case which will allow of no such swelling

- (3) Applying splints where displacement of the fragments would otherwise occur (*e.g.*, femur, both bones of forearm or leg)

- (4) Twice or thrice daily removing any splints, massaging the part for fifteen minutes (through the plaster), and making the patient himself put into action the muscles surrounding the fracture by moving the nearest joints, the fragments being supported and held in position by an attendant

The movement obtained on the first two or three days will be very slight and cause considerable pain, and the patient will require great encouragement to attempt it

Result—Prevention of swelling—muscles kept in action, hence tone, etc., not lost—improved circulation through both muscles and also bone and other tissues of the part

The rationale of this treatment is that the contracting muscles squeeze their own vessels, and exercise pressure on the adjacent structures, which pressure is transmitted to the skin the skin, however, has been transformed from an elastic body into an inelastic one, hence the structures between the contracting muscles and the inelastic skin are pressed upon hence all effused blood and lymph tends to be driven from the part back into the circulation, also the veins, large and small, are emptied

The sum total is that (1) the clogged circulation of the part is set going again

(2) The functional activity and tone of the muscle is retained

(3) Swelling is decreased in cases where swelling had already occurred before the case came under treatment in these cases after two or three days the plaster will be found to be quite loose and require renewal

(4) The improved circulation improves the conditions for bone-healing, and this readily and quickly takes place

(5) Directly the bone is firmly united, the limb can be used at once as the muscles are not wasted or deficient in tone

The advantages of this third method of treatment over the second are that the bone unites more rapidly and that the muscles are kept in 'condition' by daily voluntary movement

The following are the details of three cases of fracture recently treated by me at the Cantonment General Hospital, Mian Min—

Case I—An S & T Drabi, age 30, admitted 8th February, 1905 Fracture of lower end right radius and styloid process of ulna, giving typical 'Colles's fracture'

Admitted immediately after sustaining fracture Deformity was reduced by pulling on the hand and manipulating the wrist the part was gently massaged for 15 minutes Strips of strapping 1 inch broad and ten long were laid around the base of the hand, the wrist, and the lower third of the forearm the lowermost strip passed over the bases of the metacarpal bones and the ends, after crossing lay on the thenar and hypotenar eminences, and thus the strip followed the contour of the skin and lay flush with it the next strip overlapped this about $\frac{1}{4}$ inch and each succeeding strip similarly, each strip overlapping the preceding one, and while being wholly in contact with the skin and following its outline closely, yet not being drawn tight.

Thus the lower end of the forearm and wrist were covered in with a closely fitting case of adhesive plaster A Carr's splint was now applied

Three times daily the splint was removed, and the wrist and forearm massaged, and the patient made to move his wrist and fingers, the region of the fracture being clasped by and supported by one hand of the attendant

On the third day the hand was clasped, and the forearm gently rotated a very little, and each day subsequently this was increased

On the seventh day the splint was discarded, the forearm placed in a sling, and the hand and fingers used for light work, *e.g.*, at meals The massage and voluntary movements were continued three times daily

On 3rd March 1905, the man was discharged to duty, having full range of movements of wrist, both flexion extension, and rotation and no deformity he was recommended for a fortnight's light duty prior to taking up again the heavy work of attending to his four mules

Case No II—An S & T Drabi, age 25, admitted 8th February 1905 Fracture in lower third of left leg, of both bones with comminution, and abrasion of the skin on anterior surface of limb over the fractures He was dismounting from his *bail gari* with his foot on a spoke of the wheel when, without warning the bails, started his leg was crushed between a spoke and the body of the cart

He came under treatment immediately The abrasion of the skin prevented much massage of the limb being done the abrasion was treated antiseptically The bones were pulled into position and back, and side splints applied, and the leg slung in a cradle

Next day there was much swelling with pitting on pressure over all the leg The side splints were removed, and the leg massaged, commencing at the proximal end and finishing at the distal end of the swelling which

was round the foot the seat of the fracture was then supported by the hands, and the patient encouraged to slightly move his toes and then his ankle joint. The splints were then re-applied.

This was repeated three times daily.

On the fourth day strips of strapping, 2 inches wide and sufficiently long to overlap, were applied round the limb from the ankle to junction of upper and middle thirds of leg. Each strip overlapped the preceding one. Iodoform ointment smeared on lint was placed between the abrasion and the adhesive plaster, thus the leg was surrounded by a closely fitting (but not tight) case composed of these strips.

The same treatment of massage and voluntary movement was daily continued, the former being done through the strapping. The swelling had disappeared before the application of the strapping.

This treatment was continued for three weeks when the splints were removed and the limb allowed to recline on its side against a pillow. The bones were now soundly healed in good position, there was very little callus, the juncture was still a little tender, but the toes, ankle and knee could be easily and painlessly moved. A pad of wool was placed to fill in the depression behind the heel and fixed by a bandage so as to counteract any tendency to bending of the junction from pressure of the heel on the bed and no support beneath the fracture.

By the middle of the fourth week the patient was allowed up on crutches, the foot being at first slung off the ground by a strip of bandage passing round his neck. By the end of the fourth week he could stand and walk a short distance without the sling but with crutches. By the middle of the fifth week he could walk with the aid of a stick only. On 20th March 1905 he was recommended for two weeks' leave home prior to returning to duty.

Case No. III—Syce, aged 19, admitted 8th March 1905. Fell on shoulder, fracturing neck of humerus. Admitted some 12 hours after the injury. There was considerable swelling of the shoulder. This was massaged for fifteen minutes. A pad of wool was then placed in axilla and strips of strapping 3 inches broad were narrowed to $\frac{1}{2}$ inch width in the middle. This narrowed middle portion was placed over the wool in axilla and the ends crossed over highest point of shoulder and fastened to the front and back of the chest, reaching to the midline. The next, similar in shape, overlaid the first in the axilla but overlapped it elsewhere and so on. The lowest strip (1 inch wide) was placed horizontally round the top of the arm, thus the whole shoulder was covered in by a closely fitting adhesive plaster case. The wrist was placed in a sling.

The forearm being held in one hand and the elbow in the other, the patient was encouraged to raise the whole shoulder, then to bring into very slight action the anterior and posterior fibres of the deltoid muscle by a slight forward and backward pendulum like motion of the arm.

These movements, together with massage through the plaster, were continued once daily for four days, after the first two days the movements caused little or no pain, the range of the pendulum movement was daily slightly increased.

By the end of four days the plaster case had become quite loose and was replaced by another again close fitting.

After a week very gradual movements of abduction (outer fibres deltoid) were commenced.

By the tenth day a considerable amount of movement of the shoulder joint in all directions could be done during these the attendant always supported the weight of the limb so as not to throw strain on the healing fracture.

The head of the humerus could now easily be felt to rotate in the glenoid cavity on rotating the forearm round the arm.

On 3rd April, 1905, he could painlessly and freely move his shoulder joint in all directions. On 6th April, 1905, he was discharged to duty.

TWO CASES OF PNEUMOCOCCIC SEPTICÆMIA WITH SOME REMARKS ON PNEUMONIA AS SEEN ON THE NORTH-WEST FRONTIER

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A DECIDED tendency to become septicæmic is characteristic of all pneumococcic infections. This fact is now universally admitted. Some observers go still further and maintain that pneumonia is generally, if not always, a septicæmia. It is not surprising, therefore, to meet with cases of pneumonia every now and then in which septicæmic or even pyæmic symptoms predominate, and the original local pulmonary lesion sinks into comparative insignificance. Such cases are continually being recorded in the medical journals, and, in view of our increasing knowledge on the subject, are always of interest. The following two cases present several unusual characteristics, and it is for this reason that I venture to place them on record—

Case I—N.D., a Pathan sepoy, aged 21, was taken ill on the 29th February 1905. He was a strong robust man who up to this date had always enjoyed good health. The onset of his illness was typical of pneumonia, and by the fourth day of disease signs of pneumonic consolidation of the whole of the right lung had fully developed. The sputa were rusty, and almost all the classical signs and symptoms of this disease were in evidence. Thus far the disease had run its usual course. The patient's strength was well maintained, and the prognosis appeared to be extremely good. A crisis did not occur, but the fever gradually subsided by lysis. The temperature did not fall below normal till the sixteenth day of disease. In spite of this prolonged pyrexia the general condition of the patient remained quite satisfactory. On the 19th February, the 22nd day of disease, about midday the patient suddenly and without any premonitory symptoms had a rigor. The temperature rose to 104.2°, much headache was complained of and slight clonic convulsions, chiefly affecting the upper extremities, occurred. The patient became increasingly drowsy and by 3 P.M. was quite unconscious. I saw him about 5.30. He was lying curled up on his side. He was restless, but loss of consciousness appeared to be complete. All the limbs were flexed. The head was markedly retracted with rigidity of the neck muscles. All the reflexes were increased. Babinski's sign was present. The pupils were equal, widely dilated, and did not react to light, a condition of paralytic mydriasis. No paresis of any of the voluntary muscles was detected. Urine was passed involuntarily. The signs of pneumonia in the lung had all but cleared up. The heart's action was regular, the sounds clear, and no added sounds were heard on auscultation. There was no sign of any ear disease. There was no cutaneous eruption. A diagnosis of meningitis, with special involvement of the membranes at the base of the brain, was made.

The following day the condition had changed, but little loss of consciousness was, if any thing, more

absolute. The pupils were now in a condition of spastic myosis. The patient was quite unable to swallow and had to be fed by means of nutrient enemata. With a view to confirming the diagnosis and, if possible, alleviating the symptoms, I performed a Quincke's lumbar puncture. The puncture was made in the usual way between the second and third lumbar vertebrae. An antitoxin needle was used for the purpose. About 20 c. c. of cerebro spinal fluid were allowed to escape. The fluid was opalescent and straw coloured. On standing a sediment deposited which on microscopic examination was seen to consist chiefly of polymuclear cells, many of them broken down and degenerated. Some diplococci staining by Gram's method were seen; they were very few in number. Inoculation experiments on a rabbit were performed, but produced no definite results. This was possibly due to faulty technique almost unavoidable, considering the circumstances under which the experiments had to be carried out. There was considerable delay between the withdrawal of the fluid and the inoculation into the rabbit. The diagnosis of meningitis however had been fully confirmed, and that it was a pneumococcic meningitis can hardly be doubted, taking into consideration the clinical history of the case.

The immediate results of the small operation were surprisingly good, and before the elapse of twelve hours, consciousness had been completely regained. The patient was able to understand and answer questions put to him, though he appeared to have some difficulty with his speech. Once more he was able to swallow, and he took nourishment well. He complained of pain all over his body. The pupils were equal and reacted to light and accommodation. Vision was apparently good. All the reflexes were still exaggerated, and an ankle clonus was obtained. Urine was passed involuntarily. There was no reduction in the pyrexia.

This marked and encouraging improvement was, however, unfortunately not maintained. The patient developed well marked aphasia. My note made on 25th March reads "Condition much weaker. internal strabismus left eye, vertical nystagmus, the pupils do not react to light. The patient is apparently unable to understand words spoken and quite unable to speak. A systolic murmur is heard loudest at the aortic bases? malignant endocarditis. Can still swallow and takes nourishment fairly well, the urine contains much albumen."

The patient died the following day. I was unable to obtain a *post mortem* examination.

I have recorded this case in some detail, because, as will have been observed, it differs in many points from pneumococcus meningitis as described in text-books. The diagnosis in this case was attended with but little difficulty. It would appear from recorded cases that a diagnosis is rarely possible during life. The ease with which it could be made in this case I attribute to the unusual extent to which the base of the brain was involved. The onset of meningitis so late in the disease, *i.e.*, after a brief period of apparent convalescence, appears also to be unusual. Perhaps the most interesting feature of the case was the marked improvement that followed the simple operation of lumbar puncture and the withdrawal of so small a quantity of fluid. Such a result not infrequently follows the operation in cases of epidemic cerebrospinal meningitis, but of the value of lumbar puncture as a therapeutic measure in pneumococcic meningitis, I have no previous experience, nor do I know of any recorded cases illustrative of the point.

In view of the experience gained by this case I should not hesitate to perform the operation should any similar case come under my care. As an aid to diagnosis the procedure is invaluable. It is easy to perform and quite free from danger provided that reasonable care be taken. In the above case I should have repeated the operation had not the condition of the heart been so suggestive of malignant endocarditis, a disease so commonly associated with this form of meningitis. Any treatment that holds out any hope of success is worth following in a disease that has, as far as I am aware, proved invariably fatal. Our hope for the future must however lie mainly in serum therapy.

Case No. II—P. Singh, a Rajput sepoy, aged 22, was taken ill on 23rd October 1904, with pneumonia. The bases of both lungs were affected. The attack was a severe one, symptoms of toxæmia were pronounced, and the case gave rise to a good deal of anxiety. A crisis did not occur, and the temperature falling by lysis did not reach normal till the fourteenth day of disease. For twenty-four hours the temperature remained down. On the fifteenth day the patient had a rigor and the temperature rose to 101.5. Coincident with the rise of temperature the patient complained of severe pain and tenderness in the region of the right parotid salivary gland, which gland was noticed to be distinctly swollen. The swelling increased, and the case presented all the features of an attack of acute parotitis. The constitutional symptoms were severe and out of all proportion to the comparatively trivial nature of the local lesion. For this reason I judged that the parotitis, if due to the pneumococcus, as seemed probable, was due to a blood infection, and not to direct infection from the buccal cavity by way of Stenson's duct.

Thirty-six hours from the commencement of the attack pus had begun to discharge into the mouth from Stenson's duct. An abscess had apparently formed and ruptured into the duct. The discharge of pus was free. The pus was thick and laudable. The pus cells were crowded with diplococci which both in morphology and staining characteristics bore every resemblance to Fænkell's encapsulated diplococcus lanceolatus pneumoniae. These diplococci were also found free in the liquor puris.

After the discharge of pus had been established the patient rapidly recovered, entering upon an uneventful convalescence.

Parotitis is a rare complication of pneumonia. Its occurrence is mentioned in some of the text-books, but only scant attention is paid to the subject. Osler says it occurs commonly in association with endocarditis. No reference at all is made to it in two or three of the more recent papers that have been published on pneumococcus pyæmia that I have had the opportunity of referring to. Pneumonia, as it occurs amongst the Native Troops on this Frontier, appears to me to differ in several ways from the disease as seen in Europe amongst Europeans. The differences are more those of degree than of kind, and are, I believe, dependant upon the lesser degree of resistance that a native offers to pneumococcal invasion as compared with a European.

* "Pneumonia is not a local but a universal disease and the brunt of it may fall on any part—

* "Medical Lectures and Aphorisms" by Samuel Gee, p. 251

lungs, endocardium, membranes of the brain, intestines, kidneys" This aphorism is more apparent here than it is at home. In the vast majority of severe attacks it is the toxæmia which gives rise to so much trouble and anxiety, in comparison with the toxæmia the extent of the pulmonary lesion is in the majority of cases of only secondary importance. In most of the fatal cases the heart failure appears as a symptom of acute pneumococcus-poisoning and is not brought about mechanically by an impeded pulmonary circulation and an overdistended right heart. These remarks are founded upon the last forty-five consecutive cases that I have had under my care.

The attack is often ushered in with all the symptoms of acute septic intoxication. I have notes of eight cases seen during the last two months in which an acute diarrhoea was the most prominent symptom at the onset. The diarrhoea was accompanied by vomiting. All these patients had extremely severe attacks, and though they were previously all strong healthy men, four of the eight died. I have come to regard this symptom as of grave omen and an indication of a very severe infection. It is in combating the effects of this toxæmia that one is at present so helpless, and the want of a trustworthy anti-pneumococcic serum is always making itself felt. The occurrence of a crisis is not such a constant feature of the disease as it is in Europe, and delayed resolution appears to occur more frequently. Albuminuria appears to be fairly constant and not infrequently persists for a short time after the return of the temperature to normal. These remarks are applicable to the acute lobar form of the disease. In addition to lobar pneumonia, I have, during the last two years, had under my care several cases of broncho-pneumonia or acute capillary bronchitis. The cases I refer to here were all either primary broncho-pneumonias or broncho-pneumonias secondary to bronchitis of the larger tubes. Such cases are of course common enough in children and in old debilitated subjects in Europe, but of the occurrence of the disease in strong healthy adults and men in the prime of life I had had, before coming to this frontier, no previous experience. I have met with such cases in Wana and in Malakand. They all occurred during the winter months when lobar pneumonia was more or less prevalent. I at first assumed that two diseases so different in their symptomatology must owe their origin to different micro-organisms, but I have now reason to believe that in the majority, if not in all cases of the broncho-pneumonic form of the disease Fænkell's pneumococcus is the offending agent. To this point I will refer again later.

The onset of the disease is insidious. A rigor is the exception. The patient comes to hospital complaining of cough and fever. The fever is rarely high. The cough is the most distressing

symptom and is often incessant. The sputa, at first mucous or mucopurulent, become more and more purulent as the case advances, and in most of the fatal cases that I have seen, the sputa consisted almost entirely of pus for some days before death. The sputa are never "rusty" and but rarely blood-stained. The physical signs vary considerably. Both lungs are always affected. Patches of dulness or impaired percussion note sometimes develop late in the disease. Fine crackling "subcrepitant" râles are the most characteristic of the physical signs. In addition signs indicative of bronchitis of the larger tubes are often present. The breath sounds are usually harsh, but rarely truly "bronchial" in character. A pleuritic rub is sometimes heard.

A crisis never occurs, and the disease is by no means a self-limited one in the sense that lobar pneumonia is. The disease has a high mortality. In the last three fatal cases that I have seen death occurred on the 12th, 15th and 12th day of disease respectively. In cases that recover the temperature may not reach normal till the twentieth day of disease. There is nothing characteristic about the temperature chart, it is irregularly remittent. There appears to be a well-marked leucocytosis in cases that are doing well. The leucocytosis chiefly affects the polynuclear cells. I have examined the sputa in many cases. Fænkell's pneumococcus is the only constant organism. This appears to be invariably present in large numbers.

In the only *post-mortem* examination that I have been enabled to perform on these cases, the lung was found teeming with this diplococcus which was present in pure culture. The patient in question died on the 12th day of disease. The lungs in this case were typically broncho-pneumonia and exhibited patches of collapsed engorged and consolidated lung. Where the disease was most advanced, several patches had coalesced and resulted in an area which to naked eye examination closely resembled gray hepatization. Well-marked compensatory emphysema was present. In smears taken from a freshly cut surface of the spleen, I found the pneumococcus in considerable numbers, thus demonstrating the septicæmic nature of the disease.

The treatment of the disease I have found to be most unsatisfactory. Here again an anti-pneumococcic serum would sometimes prove invaluable.

Why the pneumococcus should sometimes cause a lobar pneumonia and sometimes a broncho-pneumonia is one of the many questions that must remain unanswered until more is known of the bacteriology of the two diseases. The subject is of great interest and, considering the low degree of resistance offered by the native to pneumococcal invasion, it is one of very considerable importance in this country.

OBSCURE IRREGULAR CONTINUED FEVERS OF THE "TYPHOID" GROUP AND THEIR PROBABLE RELATION WITH DIFFERENT SPECIES OF BACILLI OF THE TYPHO-COLI RACE—AS SEEN FROM THE SPECIFIC BACTERIOLYTIC VALUE OF BLOOD SERUMS OF SUCH CASES ON VARIOUS MEMBERS OF TYPHO-COLI GROUP OF MICROBES

BY R. ROW, M.D. (LOND.), D.Sc. (LOND.) *

(From the F. D. Pettit Laboratory, Byculla, Bombay)

ALTHOUGH for many years it was disputed whether Indians could ever contract enteric fever, the results of recent observations on this subject may be taken to leave no doubt that natives of this country not only do get the disease, going through the usual clinical course, but also that the nature of the disease can be verified both bacteriologically and when occasion arises by the examination of the enteric lesions post-mortem. Dr Childe in a paper¹ read before this Society in 1902 brought forward conclusive evidence to show the presence of enteric fever in Bombay from a series of his cases, where he applied Widal's test to support his clinical diagnosis. In 1899 I had an opportunity of bringing to the notice of the profession² some positive agglutination reactions with *B. Typhosus* while investigating the part played by soils in the ætiology of enteric fever in Bombay. These facts do not concern directly with the subject of the present paper, but a reference to these has had to be made here because of their bearing on a set of fevers of a continuous type familiar to Bombay—fevers characterised by their atypical and irregular course, running on for 7, 11, 14, or 21 days, or even 4 to 6 weeks with pronounced abdominal and later on typhoid symptoms, with no definite physical signs to guide one, and where even blood examination baffles the observer as to the nature of the case, and throws no light beyond that the blood is sterile, and that it is free from malarial, relapsing or other parasites, and that it is not enteric, caused by *Typhus abdominalis*. These cases, it may be added, are troubled by a distended abdomen following a history of indigestion, irregular loose motions often foetid, a high fever of a continuous type, a slow pulse which may not go beyond 100 with a temperature of 103° and 104°, very often quivering and sometimes tenderness in the right iliac fossa, and they terminate in fatal cases with typhoid symptoms or hæmorrhages from the bowels.

Although the broad features enumerated above may be taken to indicate that one has to deal with some intestinal mischief, yet in view of the marked irregularity in course of these fevers and still more remarkable uncertainty of their

duration, one can hardly resist the temptation of assuming that, after all, in these fevers we may have the evidence of a multiple phenomenon resulting not from a single cause—but from a varying or even a multiple cause, and it is with a desire to ascertain this possibility that the following research was undertaken.

METHOD, &c

Fresh blood serum from patients suffering from continued fever is mixed with an equal part of a freshly-made saline emulsion of a 24-hour old agar growth of 3 or more species of bacilli ranging from *B. typhosus* to *B. coli communis*, and such mixtures are made with sterile precautions into hanging drops for observation, immediately, after $\frac{1}{2}$ to 1 hour, and after 24 hours' interaction. The specimens are examined either in a fresh condition or better after drying, fixing and staining in the ordinary way. Further, a culture is made from a 24-hour hanging drop on a dry surface of agar, taking care to run the contents of the whole drop of each of the series in the form of a definite streak and incubated for 24 hours, so that at the end of this period one can get an idea of the richness or otherwise of the bacillary contents of a 24-hour hanging drop. In this way multiple evidence is obtained of the properties of the particular blood serum acting on the different bacilli for a definite period of time, and the whole series of observations is taken into consideration before deciding on the active potency of any blood serum on a particular micro-organism. Further, by the method described above, one can obtain a definite idea of the comparative bactericidal value of a particular serum on various species of the bacilli one operates with. The nature of the positive reactions obtained is, as a rule, lysogenic, though rarely one may not get any evidence beyond that of the presence of agglutinins.

The result of experiments and the inferences drawn therefrom are best illustrated by means of diagrams taken from actual specimens. I propose to give here the diagrams of one illustrative case side by side with the reaction of blood serum of a healthy individual to serve as control. The reactions observed and their interpretations are as follows—

- (1) A drop made and examined immediately shows a uniform and rich distribution of bacilli, i.e., a negative reaction.
- (2) The serum after half hour's action may show—
 - (a) either no change—a negative reaction,
 - (b) a diminution in the number of the bacilli as compared with (1) which serves as a control. This diminution, is not due to the opsonic action described by Wright,³ but an actual alteration of the bodies of the bacilli which in some specimens appear degenerate and difficult to stain.

* Being a paper read at the Bombay Medical and Physical Society.

- (c) a complete dissolution of the bacilli
So that a stained drop shows not a single well-stained bacillus, but only here and there a mere shadow of the bacilli seen in the control,
- (d) formation of large clumps of bacilli, indicating the presence of agglutinins
- (3) A 24-hour drop may show the following characters —
- (a) a rich growth in masses of bacilli like the original ones, showing a negative reaction and not even inhibition, of the growth,
- (b) an inhibited growth of bacilli in longish or filamentous forms sparingly distributed throughout the drop, showing a partial reaction,
- (c) an appearance of masses of clumps of bacilli with wide clear spaces

between, showing the presence of even production of agglutinins in vitro,

- (d) a destruction of bacilli in a 24-hour drop culture This is confirmed by the agar culture of the drop in the manner indicated above — showing a rich production of lysins

Thus the reactions, in short, are (I) complete bacteriolysis, (II) partial bacteriolysis, (III) definite agglutination, produced by agglutinins already present in the serum or subsequently produced in vitro by the leucocytes, some of which are accidentally carried in the serum, (IV) indefinite agglutination, and (V) a negative reaction

The inferences drawn from the observation of the other cases are herewith given in a tabular form

Summary of Cases and Observations

No	Short Description of Case	Methods employed and Time given for reaction	With B C C	With B G	With B T
1	A P 7 days' irregular fever, high temperature, slow pulse, irregular motions	Sedimentation 18 hours	Very strong	<i>Nil</i>	<i>Nil</i>
2	Dr S's case from ward said to have responded to Widal's test for typhoid, T 102° on 16th day	$\frac{1}{2}$ hour's reaction in H D 24 hours in H D	Very marked large clumps All bacilli destroyed	Not tried	Very feeble clumping All bacilli destroyed <i>Nil</i>
3	Dr Khawjah A's case 22 days irregular continued fever, jaundiced tint of conjunctiva marked by slow pulse, motions costive and foetid	$\frac{1}{2}$ hour's reaction in H D	Very marked clumps		
4	Dr Pil's son 8 days' fever, relapse from 2 months' fever with 10 days of apyrexia Had a large spleen and $\frac{1}{2}$ albumen in urine, no malarial parasite in his blood	$\frac{1}{2}$ hour's reaction in H D 24 hours H D	<i>Nil</i> Rich growth	<i>Nil</i> Rich growth	Well marked clumps Only one small clump seen in the centre of the drop, the rest is clear
5	S 18 days' typhoid remittent fever, quick pulse	$\frac{1}{2}$ hour's H D reaction 24 hours in H D	No clumps Rich growth	<i>Nil</i>	Well marked clumps No bacilli seen in H D
6	V G 7 days' fatal fever typhoid symptoms, blood seen on 6th day	$\frac{1}{2}$ hour's reaction in H D 24 hours in H D	Strong reaction, large clumps Complete bacteriolysis	Well marked clumps Partial bacteriolysis	Very slight clumping Hardly any diminution in clumps
7	Dr S's case same as (2), 8 days after apyrexia	$\frac{1}{2}$ hour in H D	Very slightly marked	<i>Nil</i>	Fairly well marked
8	G M student 2nd relapse in typhoid fever, with positive Widal's test for B T	$\frac{1}{2}$ hour in H D	Not tried		Strong agglutination
9	Dr R's case 13 days' fever, diarrhoea at first, then strong constipation after 9th day, delirium, pulse slow	24 hours in H D $\frac{1}{2}$ hours H D 24 hours H D	Large clumps Complete bacteriolysis		Small clumps Only paralytic phenomenon, no clumps Complete bacteriolysis
10	S 24 days' fever, diarrhoea, peritonitis, p 120	24 hours' H D	Greatly inhibited	Diffuse and rich growth	Diffuse and rich growth
11	F 13 days' fatal fever, on 11th day T 103°, p 108, delirium and dry brown tongue	$\frac{1}{2}$ hour's H D 24 hours' H D	Complete bacteriolysis	Rich and diffuse growth	Immediate clumping, strong agglutination Complete bacteriolysis

Summary of Cases and Observations — (Continued)

No	Short Description of Case	Methods employed and time given for reaction	With B C C	With B G	With B T
12	D 6 days' fatal fever after exposure to sun, died on 6th day On 4th day p 136, T 103°	½ hours' H D 24 hours' H D	<i>Nil</i> 5 clumps in the whole drop, rest is clear	<i>Nil</i> Diffuse growth	<i>Nil</i> Diffuse growth
13	G same case as 8, 8 days of apyrexia	24 hours' H D	Complete bacteriolysis	Rich and diffuse growth, also with B Paratyphosus	Large cluster of bacilli
14	G 11 days' continued fever, then free for 4 days, and when seen on 16th day had T 102° Marked abdominal symptom, p 130, enlarged spleen, no malaria	24 hours' H D	Complete bacteriolysis	Some inhibition	Complete bacteriolysis
15	W's case 7 days' irregular fever	24 hours' H D	Huge clumps in one part, the rest is clear	Diffuse and rich growth	Diffuse and rich growth, some in masses
16	S 7 days' fever, seen on 4th day, temp staircase reaching up to 104°, p 104, diarrhoea.	24 hours' H D This on Agar	Complete bacteriolysis 5 discrete colonies on streak	Complete bacteriolysis Not a single colony	Rich and diffuse growth Rich growth and diffuse.
17	K diarrhoea in the course of phthisis pulmonalis	24 hours' H D	Complete bacteriolysis	Rich growth	Rich growth
18	Dr C's case from ward age 48, man working in drains, has had similar attacks every month or so for 2 or 3 occasions	24 hours' drop	Strong bacteriolysis, 2 bacilli found in whole drop	Large clumps of growth	3 or 4 large clumps and 2 or 3 bacilli here and there
19	G convalescent, cf 14	24 hours' H D	Complete bacteriolysis	Profuse growth	Rich growth
20	H 7 days' fever, T 102° and 103° first 4 days, then free from fever for 1 day, when seen on 5th day, had 102° delirious, p 120, died on 7th day	24 hours' H D The same on Agar	Diffuse growth only in one part of the drop, the rest of which clear, i.e., great inhibition 200 colonies	Rich growth in clumps Diffuse and rich growth	Small clumps of 6 or 7 bacilli found sparingly distributed 10 colonies
21	J 7 days' fever with irregular high temperature on 4th day, T 103°, p 120, Bs irregular	24 hours' H D This on Agar	Complete destruction Tube sterile	Rich growth Rich growth	Great inhibition of bacilli 4 colonies.
22	Dr V's case, 9 days' continued fever, then intermittent till 20th day, 3 or 4 motions, pulse not slow on 18th day, T when seen was 99°	24 hours' H D This on Agar	Discrete growth, slight inhibition 100 colonies, discrete along the streak	Rich growth all over Diffuse growth	Complete bacteriolysis Tube sterile
23	L 9 days' fatal fever, on 7th day T 103–105°, p 120, meningitic signs, staccato speech	24 hours' H D on Agar	2 colonies along the streak	Diffuse growth	Growth of 300 discrete colonies, some inhibition

Summary and Conclusions

From a study of the cases cited above and analysis of the experiments given in the foregoing tables, the following preliminary conclusions may be made —

- (1) The blood serum of patients suffering from continued fevers under consideration, acts powerfully on the bacilli of Typho-coli race, and the serum reaction appears to be specific towards one or the other members of the group

- (2) The reaction is demonstrable in fresh as well as in stained preparations and is

of a lysogenic nature The bacilli are at first plasmolysed (from their bodies appearing a faint hollow and degenerate in stained preparations) and then ultimately more or less destroyed as seen from cultures (on agars) made from the bacillary saline emulsions operated on by the serum for a definite time

- (3) While some of the serum reactions are referable to a pure *Bacillus typhosus* infection (No. 4 and No 22), a good number of them points to infection by organisms other than *B typhosus*,

viz., *B enteritides Goertneri* and *Bacillus coli communis*

- (4) The reaction is sometimes pure, *i.e.*, only one member of the race is affected by the serum. But at other times more than one kind of organism is plasmolysed, indicating a mixed infection—when, however, one can observe a chief or primary reaction directed against one member of the series and a subsidiary reaction operating more feebly on another member of the race.
- (5) The nature of the serum at an early period of the disease is more or less equally (though feebly) bacteriolytic, or at all events bacterio-inhibitory towards all members of the series and it is only towards the latter part of the illness that the specific lysogenic bodies make their appearance. In other words, the effort of nature in producing the antibodies seems to specialise as the case progresses, the earlier process being a sort of general reaction.
- (6) Although, as a rule, in fevers under consideration, it is the lysogenic bodies which seem to be generated, the response to the stimulus of infection in a certain number of cases does not go beyond the production of agglutinins. And even here the specificity of agglutinins is just like that of lysins.
- (7) Relapse in the enteric fever case cited above seems to be caused by *Coli* infection superposed on the typhoid.
- (8) In mixed infections where *B coli* is one of the agents, it is noticed that lysis against this organism is elaborated early and also that this disappears with equal rapidity after the end of fever, *i.e.* this antibody is destroyed soon after its function is served and is not so lasting as the analogous body in *B typhosus* infection or in plague. Hence probably the recurrence of more than one relapse in some cases of typhoid fever.
- (9) Pure *Bacillus coli* infections seem to be the most common cause of atypical and irregular fevers dealt with here. However it is not unusual to meet with infections by *B enteritides Goertneri* or mixed infections of two or more groups of organism of this class.
- (10) These considerations seem to support my previous observation (*) on the close relationship of the different members of the typho-coli race—the products of this group of organisms

(as I then experimentally proved) when administered intravenously into rabbits inducing a train of closely allied symptoms and also marked intestinal lesions of a similar nature.

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- (2) R. Row, *Bacteriological Examination of Bombay Soils, &c.* Transactions of the Grant Medical Society, 1899.
- (3) Prof. A. E. Wright, On Opsonins, *British Medical Journal*, September 10th 1904.
- (4) R. Row, On Enteric lesions induced artificially by bacillary products. *Journal of Bombay Medical and Physical Society* September, 1900.

ADDENDUM

Since sending the above notes to the Press, I have been enabled, by the kindness of Captain P. Mackie, I.M.S., to go through an interesting article on Enteric Fevers in India by Lt.-Colonel D. B. Spencer, I.M.S. (*Indian Medical Gazette*, April, 1900). Lt.-Colonel Spencer's observations from a clinical point of view are in harmony with those of mine, and they strongly support the inferences above enumerated and drawn from bacteriological evidence. I concur with the views of Lt.-Colonel Spencer that, apart from the genuine enteric fever (produced by Eberth's bacillus) met with in India, we have often to deal with a group of fevers which, though generally styled as "typhoid," are in reality intestinal infection, produced, as I believe, primarily by a single or a mixture of enteric bacilli (distinct from, although closely allied to, Eberth's *Bacillus typhosus*) setting up a simple or a complex reaction on the part of the patient and in some cases a complex phenomenon resulting from secondary infections superposed in the course of reaction set up by the primary cause.

A PRELIMINARY PAPER ON EXTIRPATION OF THE LACHRYMAL SAC IN INDIA

By R. H. ELLIOT, M.D., F.R.C.S. (ENG.).

MAJOR, I.M.S.,

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In the *Ophthalmoscope* of October, 1903, I published an article entitled "Some modern opinions on the Treatment of Inflammation and Stricture of the Lachrymal Passages," in which I dealt with the views of a number of Continental and other surgeons with whom I had had the opportunity of discussing this subject.

Since my return to India I have had a large number of cases of lachrymal obstruction, and have modified my practice in the treatment of

this disease on the lines of the general trend of Continental opinion

The average Indian patient is timid and poor. He comes a long distance to see a specialist, and if the treatment is painful, as probe treatment is, or if he is not speedily cured, he returns home in spite of promises or advice. Many of the cases of lachrymal obstruction and dacryo-cystitis which present themselves are very long standing ones.

Extirpation of the sac is therefore an ideal method of treatment in India. Ten days after operation the patient can safely return home. Be it remembered, too, that the Indian villager whilst cultivating, and whilst moving about at night in the scrub, is very liable to minor eye injuries which in a patient with lachrymal obstruction are prone to lead to very serious consequences. Other frequent causes of minor eye injuries out here are scratches from the dirty nails of children, and the entrance of insects into the eye, whilst the corneal complication of ophthalmia, small-pox and plague are both serious and common.

Two important considerations were before one (1) to determine the classes of cases in which removal of the sac was indicated in India, or indeed in any tropical or subtropical country, and (ii) to ascertain whether in the heat, glare and dust of the East, the results of the operation would be as good as they have proved to be in Europe.

The indications I now recognise are as follows —

- (1) Dilatation of the sac
- (2) Purulence of the sac-contents
- (3) History of previous attacks of phlegmonous dacryo-cystitis (as indicated by the patient's account, or by the presence of a fistula or scars of an old fistula), with persistence of the condition of stricture
- (4) A history of long-standing obstruction combined with the inability of a patient to remain for a long period under treatment, or with a timidity which renders it unlikely that probe treatment will be persisted in

In fact I now operate on Indian patients for the removal of the sac in all but the mildest cases. This is practically the rule Volchers has adopted in Kiel (*vide* my paper already quoted).

It is in no way forgotten that the period this method has been under trial in India has been short, and it is not pretended that the present article is more than a "foreword." The results obtained after one year's work have, however, been so uniformly good, and so thoroughly in accord with the experience obtained in Europe, that I think they may be of interest to Indian surgeons.

The following are some statistics obtained by analyzing the results of the operation as per-

formed on 40 patients between May 5th, 1904, and May 5th, 1905

Age —	Below 20 years	5 (3, 3, 14, 15 and 16 years of age, respectively)		
	Over 20 and below 40	8		
	" 40 " " 60	19		
	" 60 " over	8		
Race —	Europeans	2		
	Eurasians	4		
	Mahomedans	4		
	Hindus	30		
Sex —		Europeans and Eurasians	Natives	Total
	Males	2	20	22
	Females	4	14	18
Side —	Right side	15	Total number of patients 40	
	Left side	18		
	Both sides	7		
			Total number of operations 47	
Sac —	Enlarged in	35 patients	{ Slightly so in 5	
	Not enlarged in	5 "	{ Markedly so in 30	
History of duration of disease very unreliable,				
	Less than 1 year in	8		
	More " 1 " " 32			
Previous treatment attempted in five cases				
Why undertaken —				
	(1) On account of timidity and residence outside Madras in			31
	*(2) To prepare patients for cataract extraction in			5
	(3) On account of failure of other treatment in (Europeans 2 and Native 1)			3
	(4) On account of septic ulcers in			1
			TOTAL	40

Details of operation —

1	Lant plug used in first only	1
2	Healed throughout by first intention in	44
3	Some accumulation of pus in wound requiring further bandage after first dressing (the wound healed soundly on the ninth day in 1, and on the fourteenth day in the other	2
	TOTAL	47 operations.

The first of these two cases is dealt with later on. The delay being due to the flooding of the wound with pus whilst removing a mucocele of exceptional size. In the other case the sac was exceptionally thick-walled and adherent, and it was removed with great difficulty.

Hæmorrhage was troublesome in seven. The sac was adherent in two of these.

The sac was adherent in ten, and thick walled with a small cavity in nine of these.

The sac was shrunken but not markedly adherent in four.

The average stay in the hospital of 37 out of the 40 cases, was 8.83 days. The remaining three stayed longer periods, because they were admitted for other diseases. Otherwise all of the three might have been discharged at the end of one week, as all healed by first intention.

After discharge the patients were kept a fortnight or more under observation in the outpatient room and all stated they were much relieved.

* Of these five cases, two have been successfully operated on for cataract, one has undergone a preliminary iridectomy as a prelude to cataract extraction, and two are waiting till the cataracts mature.

Seven were seen at later periods. One patient returned on the 48th day with a superficial abscess under the scar. This was opened and healed at once. She was seen eight and-a-half months later and was then well. She was much relieved, and had no trouble except some epiphora when exposed to wind or glare.

One patient on the sixth day developed a violent herpetic eruption along the course of the supra-troclear and supra-orbital nerve of the operated side. He rapidly recovered, and an iridectomy was performed subsequently without accident. He is still under observation two months after the first operation, and is much more comfortable since its performance.

Other patients were seen one month, seven days, two months, two and-a-half months, three months and six and-a-half months, respectively, after operation. All professed themselves greatly relieved. They stated that the foul discharge had ceased, that they had now no watering except in wind or glare, and that they were greatly relieved by the operation.

In one case, for the photo of which I am indebted to Captain F. D. S. Fayrer, I.M.S., both sacs were dilated, the swelling on the right



side being of exceptional size. It measured 23 mm vertically and 20 mm horizontally, and stood out from the face like a marble under the skin. It was full of thick pus, which it was found impossible to keep out of the wound. The result was a delay in healing of the wound (already noted above).

Operation for Extirpation of the Lachrymal Sac

The method I employ is a modification of that used by Volchels. The upper limit of the incision is marked by the dome of the sac. This can be felt or seen when the sac is dilated, otherwise it can be fixed by drawing the lids outwards and so placing the internal palpebral ligament on the stretch. The tight band which thus stands out crosses the dome of an undilated sac. From this point an incision is carried downwards and then outwards following the bony margin of the orbit. The length of the incision varies according to the patient, but I very seldom find it necessary to make it as long as Axenfeld does, viz., 25 mm. About 15 mm usually gives plenty of room. If the sac is distended and not tightly bound down by long standing inflammation to the surrounding structure, it can be easily exposed and defined by dissecting through the dense layer of fascia which covers it and which is continuous with the internal palpebral ligament. The ligament itself should always be spared, if possible. If the parts are matted from long standing inflammation, it is better to cut down boldly on to the crest of the superior maxilla which borders the commencement of the lachrymal canal, and to introduce a sharp-edged small raspatory behind the sac which can then be easily separated from the bone on its inner and posterior surfaces. With the same instrument one can often separate the outer portion of the sac below the entrance of the canaliculi. With a blunt-pointed forceps and a pair of blunt-pointed scissors bent-on-the-flat, the dome of the sac is dissected out, the canaliculi cut across, and the lower part of the sac followed down as low as possible into the lachrymal canal and there cut off. All hæmorrhage is stopped by pressure, aided if need be by adrenalin. I find that small sterilised cotton-wool sponges mounted on sticks plug the wound better than any other means and so help to quickly control bleeding. As soon as the wound is dry, it is searched in its lower part for any portions of mucous membrane which may project from the nasal duct and these are carefully removed, a pair of fine-pointed forceps being passed down the duct for the purpose. A probe (No. 9—11, Theobald) is thrust down the nasal duct to insure free drainage, and as soon as the channel is dry, a spindle-shaped cautery is boldly plunged down it destroying any remains of diseased mucous membrane. The cavity is washed out with 1% perchloride solution and the wound closed by three sutures. The operated eye is alone closed. It is dressed on the sixth day and is then found to be healed. The stitches are removed and a light pad is kept on for three days more, when the cure is complete in most cases.

In my first few operations I found it not always easy to define the sac, and I contemplated filling it with some material by injection

beforehand. Whilst planning the details of this manoeuvre, subsequent experience showed me that, with the method above described, it is always possible and usually easy to remove the sac entire. The sac is always examined very carefully under water, as soon as it is removed, to make sure it has been taken away entire. I make a point of never button-holing the sac if I can avoid it, and therefore I leave the canaliculi to be dealt with as late as possible.

Hæmorrhage troubled me excessively in some of my earlier operations. I have since learnt that by making the internal palpebral ligament the upper limit of my incision and by keeping as near as possible to the inner canthus and away from the nose this complication may usually be easily avoided. By so doing one avoids the terminal branch of the facial artery which runs up the side of the nose to anastomose above the inner canthus with the nasal branch of the ophthalmic artery. It is this vessel which usually gives trouble during the operation. I use no special specula. When I commenced extirpating sacs, I employed two long threads, held by an assistant in opposite directions to keep the wound open. I now find that two pairs of fine forceps, one held by an assistant and one by myself do all I require in the way of opening the wound. Elaborate instruments are unnecessary though a luxury.

PLAGUE INFECTION AND FLIES

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THE following experiments and investigation were undertaken with a view to obtaining evidence for or against the conveyance of plague infection by flies.—

(a) A healthy rat was inoculated under the abdominal skin with a pure culture of plague bacillus obtained from the spleen of a plague rat. It sickened and died with signs of plague, and the bacillus was recovered from its spleen and heart's blood.

After placing a little of the heart's blood in a sterile watch glass the *post-mortem* incision was stitched up and the dead animal along with the watch glass of blood placed under a wire gauze meat cover along with twelve house flies.

In thirteen hours three of the flies were led into another gauze inclosure under which was placed a rat on whose back a patch had been shaved and lightly incised as if for "vaccination." This rat was fed on grain. It sickened and died in five days, and the plague bacillus was recovered from its spleen and heart's blood. On the third day of illness the scratches on the back were unhealthy in appearance and

discharging a thin sero-purulent matter. A smear from this fluid showed a few bacilli resembling plague, but in consequence of the enormous number of "septic organisms" it was impossible to cultivate. It was found necessary to confine this animal with a wash-leather straight waistcoat, for until this was done the flies were unable to settle on its back. Several experiments also failed owing to death of the flies. It was found that after exposure in a light room for some hours they thrived best when removed to a cool damp place. Pieces of blotting-paper hanging from a vessel of water were supplied.

(b) Another experiment was carried out with a healthy undamaged rat supplied with bits of meat as well as grain. To this four of the flies from a plague rat and plague blood were introduced in order that they might possibly inoculate the meat. This rat remained healthy.

(c) In three days' time maggots were seen to have developed on the incision in the eye sockets and in the anus of the plague rat. It was found that they had penetrated into the abdomen and skull and had disposed of practically all the viscera and brain. Some of these maggots were bacteriologically examined as follows—

(1) Smear preparations from the stomach contents were made,

(2) a trace of the stomach contents was well mixed with half a cubic centimetre of bouillon, and this then spread over the surface of agar jelly in a Petri dish,

(3) one maggot was embedded in paraffin and cut into a series of sections. Plague bacilli were not detected.

(d) A rat which died after inoculation with a virulent plague culture was placed unopened under the conditions of the above experiment. The flies from this introduced to wounded and unwounded rats did not convey infection.

(e) Attempts to develop the maggots from a plague rat into flies were generally unsuccessful, but by the aid of abundant moisture two weakly looking animals were obtained. These conveyed no infection when subjected to conditions above described.

Conclusions—

(1) Flies which have had access to material containing plague bacilli (e.g., the plague blood in the watch glass) can carry infection and inoculate a wound. Hence the sputum from a case of pneumonic plague and the juices of a fresh

- plague body (as in a *post-mortem* room) may be a grave source of danger,
- (2) such flies do not appear to convey infection by means of food on which they settle,
 - (3) flies which have had access to a plague body but not to the fresh juices or blood do not appear to be a source of danger. It is almost certain that the juices arising from decomposition do not contain living plague bacilli,
 - (4) maggots developed in a plague body are not a source of infection, but rather a useful agent in disposing of such material

In the above experiments the absence of fleas from all the rats was insured

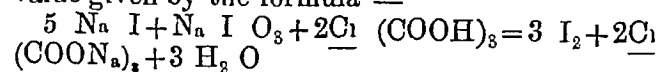
THE BACTERICIDAL POWER OF LIEUTENANT NESFIELD'S METHOD OF PURIFYING DRINKING WATER AND STERILIZING WATER FOR SURGICAL PURPOSES*

BY F N WINDSOR,
CAPT, I M S

I UNDERTOOK the following investigation at Lieutenant Nesfield's request, and although I found a bactericidal power for iodine on *B. subtilis* somewhat lower than that which he determined, yet the experiments afford strong evidence of the value of his process† for sterilizing water for surgical purposes and confirm all his other results —

1 One tablet of mixed iodide and iodate of sodium weighing two grains and one two-grain tablet of citric acid were dissolved in two ounces of distilled water and the free iodine resulting estimated with standard sodium thiosulphate

It was found that all the iodine was liberated and the quantity agreed with the theoretical value given by the formula —



2 A similar two-ounce iodine solution was prepared and stirred. Two drachms of this were introduced into two pints of water and one-eighth of a one-and-a-half grain sodium sulphite tablet was added and dissolved. The water became perfectly colourless and tasteless. It now contained sodium iodide and a sodium salt of one of the thionic acids, but in so small a quantity as to be negligible

This water was the same as would be obtained by treating two gallons with the whole tablets weighing, for the iodide and citric acid, two grains,

and for the sulphite one-and-a-half, *à fortiori* four gallons so treated would be tasteless

3 A similar two ounce solution of iodine was prepared and two Winchester quart bottles each containing four pints of filtered Junna river water were raised to the temperature of boiling water, kept so for half an hour and then cooled. One of these was inoculated with a cholera culture scraped off agar agar, and the other with a typhoid culture similarly obtained. These two bottles were well shaken and two pints from each poured into two sterile Winchester quart bottles, thus giving two typhoid and two cholera bottles. Two drachms of the iodine solution were added to one of the typhoid, and one of the cholera bottles and the contents mixed by rolling the vessels. The remaining two bottles without iodine were similarly rolled and retained to serve as controls. After one minute 0.5 cc from each bottle was added to melted agar-agar which was spread and allowed to set (the ordinary process for enumerating microbes in water). In addition from the iodized typhoid and iodized cholera waters, "counts" were prepared with 1 cc and also Bouillon tubes inoculated. Similar inoculations were made again after five minutes and twenty minutes. This iodized water was the same as would be prepared by adding whole tablets of the weights mentioned to two gallons of water and the strength was 1 in 130,111 or nearly 1 in 130,000

No sulphite was added for the iodine united with the albuminous matter of the media and so was put out of action

The results are shewn in tabular form —

Strength of iodine 1 in 130,000

Water	Count after one minute in 1 c c	Count after five minutes in 1 c c	Count after twenty minutes in 1 c c	Bouillon tube
A. Untreated Typhoid water	87,000	85,000	70,000	Growth
B. Iodized Typhoid water	Nil	Nil	Nil	Nil
C. Untreated Cholera water	67,500	60,0	55,000	Growth
D. Iodized Cholera water	Nil	Nil	Nil	Nil
E. Iodized Cholera water	Nil	Nil	Nil	Nil

The growth in A and C were verified as *Bacillus typhosus* and *Vibrio cholerae* respectively

4 A precisely similar experiment was carried out by adding only one drachm of iodine solution to two pints water, or equivalent to whole tablets to four gallons and strength of iodine 1 in 260,000 nearly

The results are shewn in tabular form —

* Being the continuation of Lt. Nesfield's paper in July Number, p 268

† The explanation of this discrepancy probably is that I employed "stronger inoculations," namely, 2,200 per cubic centimetre

Strength of Iodine 1 in 260,000

Water	Count after one minute in 1 c c	Count after five minutes in 1 c c	Count after twenty minutes in 1 c c	Bouillon tube
A Untreated Typhoid water	96,000	90,000	84,000	Growth
B Iodized Typhoid water	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
C Untreated Cholera water	70,000	0,000	65,000	Growth
D Iodized Cholera water	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
E Iodized <i>Coli communis</i> water	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>

In these experiments it must be noted that the number of microbes present is extremely high, much more so than I have found in any river or well water, which I have examined in India. Since the effect of iodine is a purely chemical one, and it is fixed and removed from solution by bacteria or albuminoid matter, it is obvious that its "disinfecting" power in a certain dilution, depends on the amount of matter present with which it can unite. Therefore, although a strength of 1 in 260,000 is sufficient for the majority of river and well waters, it is probable that on service, when often the only supply is from a stagnant village tank (as in the Bajour operations of 1897) or from a river thick with albuminoid matters (as in South Africa), a strength of 1 in 130,000 at least must sometimes be employed. A "sanitary officer" would cause orders to be issued on this point.

5 A similar experiment was performed using whole tablets (2 grs iodide and acid) dissolved in one ounce distilled water and so added in one case to one pint of Agia tap water and in another to two pints. These waters had been previously inoculated with bacillus subtilis, *B anthracis* and a staphylococcus pyogenes. The strengths of iodine were respectively nearly 1 in 8,000 and 1 in 16,000. Agar-agar cultures were used.

Water	Count after one minute in 1 c c	Count after five minutes in 1 c c	Count after twenty minutes in 1 c c	Bouillon tube
Untreated anthrax	720		620	Growth
Iodine 1 in 8,000 and anthrax	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Iodine 1 in 16,000 and anthrax	92	92	<i>Nil</i>	<i>Nil</i>
Untreated Hay Bacillus	2,200		1,800	after 20 minutes Growth
Iodine 1 in 8,000 and Hay B	2	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Iodine 1 in 16,000 and Hay B	8	<i>Nil</i>	<i>Nil</i>	after 5 minutes
Iodine 1 in 16,000 and staphylococcus	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	after 5 minutes

Conclusions—The addition by Lieutenant Nesfield's method one two-grain tablet of iodide-iodate of soda and one similar tablet of citric acid to four gallons of water (previously sterilized) will kill in one minute typhoid and cholera microbes when present in number over 50,000 per c c. The addition of similar tablets to one pint of water will kill *B subtilis* and *B anthracis* when present in number over 2,000 and 500 respectively in five minutes and is fatal to ordinary pyogenic bacteria.

With regard to the bactericidal power of chlorine it was determined, in the Agia laboratory in 1904, when I had no knowledge of Lieutenant Nesfield's experiments, that 1 in 350,000 was sufficient to kill off typhoid and cholera microbes, thickly introduced into Agia tap water, but that using well water sometimes a strength of 1 in 250,000 was required. This depended on the amount of albuminoid matter in the water. In these dilutions after the water had stood for fifteen hours no taste could be detected.

These experiments were made with Bleaching Powder (so-called Calcium Hypochloride) or chlorinated lime and incidentally the extreme instability of that agent was determined. It was found that in one week the percentage of available chlorine in a bottle which had been uncorked and reclosed dropped from 27 per cent to 3 per cent in the beginning of the hot weather, while samples obtained from chemists rarely contained more than 1 per cent, and thus were practically useless for disinfecting purposes.

This shews the value of Lieutenant Nesfield's method of employing liquid chlorine which is of course absolutely stable.

The bactericidal powers of chlorine and iodine have been determined by many observers, but inasmuch as their results give much higher proportions as necessary to those quoted above, I am led to the conclusion that both cultures were employed by them and that a large fraction of the agent was absorbed by the peptones, etc, present in the medium. I am not aware that any results, giving a numerical value, as shewn in my tables, have been previously published.

PUERPERAL CONVULSIONS

By A MCCABE DALLAS, D.M., & Ch., L.R.C.P.I.,

Assam

Mrs T, age 30 years, arrived in India December 1903 and married same month—fairly active habits, cultured and refined, always enjoying excellent health, well built, robust, and of ample pelvic capacity presented no acquired or hereditary indications of any disease—general family history very good. First pregnancy time for

completion fixed for last week in January current year—arrived at this station for the purpose at the end of eighth month to reside with friends and be under my care—came earlier than arranged owing to being attacked some days previous with a continual desire to micturate, a burning sensation while doing so, the urine not being under control and occasionally staining her linen a deep saffronized color. She was also more or less constipated, and latterly her legs and feet became considerably swollen. The constipation and swelling were attributed to a natural sequence of her state but the urinary incident rather alarmed her. There was no tendency to jaundice or other disturbance. The urine on being examined was found highly acid, normal specific much charged with bile acid and phosphates—albumen was absent nor was it detected at subsequent examinations. The microscope exhibited nothing of importance. With a modified diet, saline aperients, alkaline drinks, and gentle exercise every inconvenience in this respect disappeared in ten days. The urine returned to its proper color and the bowels acted regularly. Her disposition remained cheerful, continued her walks, was exceptionally abstemious and had no untoward presentiment of any kind. Between 5 and 6 a.m., 29th January, she began to experience the setting in of the usual characteristic pains of the first stage but not of a regular order, at times feeble, then comparatively strong, but although the strength of the pains varied there was a regularity of rhythm, being summoned about noon an examination per vaginam was at once made, a "slight show" was present, the os uteri well dilated, the head well advanced and easily recognisable in the left occipito cotyloid position, parts cool, no obstruction, the patient in no wise perturbed, there seemed however to be a deficiency of liquor amni. At 2 p.m. the second stage started, to define itself there was a little more blood stained discharge, corresponding to the rupture of membranes with no flow or gush of amniotic fluid.

The pains were regular, short and apathetic, devoid of the requisite force of bearing down. At 6 p.m. a second examination was made and the head found to have advanced satisfactorily despite the apparent want of expulsive effort. At 9 p.m. the head was well on to the perineum which had a rigid tendency, an hour later the scalp became visible with each pain, yet seemed to be slightly retarded owing to the rigidity, the patient felt alright except a bit tired. She had taken all her nourishment, but as a filip it was considered desirable to give her a rest by administering a mild soporific, and fomenting the perineum constantly as in similar instances it had a good effect in overcoming this difficulty and encouraging its dilation, complete sleep was not produced by the soporific but a comfortable composure resulted, and by 11-30 p.m. the uterus was assuming a more tonic and rhythmic condition of contraction. The

perineum more yielding and head progressing, and with each pain and interval its state of proceeding and retreating indicated a probable completion of labor well within the twenty-four hours, coupling this prospect and the patient's hopeful spirits of being over her difficulties soon there wasn't the remotest suspicion of an atom's anxiety. Except perhaps as I had surmised in a speculative manner that the assistance of the vectis might be needed at the end on account of the perineum, at 1-15 a.m. while patient was being comforted by her sister—the nurse also by the bedside—she started to talk incoherently, a general convulsive shiver was observed, complexion immediately assumed a livid hue, eyes became fixed, pupils dilated, breathing short and jerky, and pulse barely perceptible—uterine action ceased entirely and death appeared imminent. The symptoms rapidly passed into deep coma, the conjunctiva failing to respond to touch, or the pupils to light, left little room to doubt that one of the most formidable of puerperal complications had supervened in the form of cerebral apoplexy. There was an absence of plethora. The convulsive invasion had a semblance to hysteria and epilepsy yet was distinctly different to either. There was no history of one or other in patient or her family, owing to the immensity of spontaneous cerebral congestion its influence was peremptorily manifested on the heart which nearly resolved into complete syncope. Artificial respiration was resorted to at once, ammonia hypodermically, cold douching to head, bed packed with hot bottles, sinapisms to nape and precordial regions, followed by galvanism, pulse improved, but was short, quick and hard. Electricity made no impression. The tongue pressed hard against palate and teeth were firmly clenched, being a full false set they were removed, with much trouble, to safeguard against accident artificial respiration was the only prop which sustained life as any attempt at cessation threatened the pulse. Being the only person capable of practising it, I was perforce compelled to stand by while the nurse (Miss Symes) and patient's sister carried out instructions promptly and intelligently. By 4-30 a.m. I had the able assistance of Colonel R. N. Campbell, F.R.S., from Dacca, and we decided to deliver by forceps at once, the head was comparatively large and the blades required a good deal of manipulation to lock. The placenta which was adherent was removed by hand. No time was lost in waiting to see if it would be expelled naturally as all uterine action had stopped—the hæmorrhage was of the usual gush—unconsciousness was still profound—indeed being worse if anything. The child, a full healthy and well developed male, could only have died quite recently before being extracted—in fact from his appearance it looked like suspended animation, but everything possible to resuscitate him proved of no avail. The mother was quickly washed and changed into

sheets on a fresh bed alongside. Shortly after extensive tympanites set in without being relieved by turpentine enemata. Temperature of body did not rise or fall throughout course. Heat to body and cold douches to head were continued. A certain amount of uterine contraction was distinguished after contents were removed. General symptoms proceeded to get worse—by 8 a.m. hiccough and coffee grounds vomiting appeared, and persisted, by 9 a.m. vomited matter was freely tinged by blood, the breathing of a hissing and stertorous character, later on blood started to ooze from nostrils, and at 10-40 a.m. the lady died. Every precaution was taken at the onset to clear the bowel by an enema of castor oil and there was no retention of urine. The mouth never frothed at any time. The importance of this case is, that it fortunately seldom falls to the lot of the attending physician to meet with such a disastrous, dangerous and unforeseen complication in a healthy woman undergoing what might be termed a natural labor—and its the first case during a large experience of my own in twenty years' practice—devoid as it was of any premonitory or inguavescent signs "it was in all respects fulminant in its attack."

The subject is worthy for this reason to be discussed. At no moment was there the slightest necessity for instrumental interference, indeed progress on the whole was so satisfactory and natural—except perhaps the apathetic disposition in volume of pains at times—and the rigidity of perineum which had practically been overcome—that the use of instruments in my opinion was both objectionable and uncalled for. Possibly had the mother been abandoned without further attempt to save her life and the child extracted earlier it might have been saved. This seemed the only alternative. There being no positive proof despite the gravity of prognosis that the mother would die, I think the responsibility of deliberately throwing away one life with the uncertainty of saving another to be against the principles of professional conscience. I have explained that after the invasion the mother's existence entirely depended on artificial respiration—to omit this during the time necessary to extract the child and placenta left no doubt in my mind that it meant certain death to her. I do, however, think that had two medical men, or a competent assistant, been present at time of first couple of hours of attack to help—the child may have been saved if the forceps were resorted to at once. To my ideas a case of this nature confronts greater difficulties than deciding on section or craniotomy. Hysteria being out of the question it may be interesting to point out the peculiarities in this instance with regard to epilepsy and puerperal convulsions differentiating their conditions as a means of diagnosis and commenting on the absence of such symptoms which are generally anticipated to precede an attack of this kind presuming it likely to

occur. To render the comparison clearer I shall place the characters side by side.

First those that simulate, then those that differ.

Epilepsy agrees with puerperal convulsions in—

I Violent convulsions of the voluntary and respiratory muscles

II Total loss of consciousness

III Lividity of features from apnoea

IV Followed by temporary coma

They differ from each other in the following—

I Anæmia precedes the attack	I Symptoms of cerebral congestion precede the attack
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II There is no hissing respiration	II Hissing respiration very characteristic
------------------------------------	--

III Fits return periodically at long intervals	III Fits return in rapid succession
--	-------------------------------------

IV The paroxysms are seldom fatal	IV The paroxysms are often fatal
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V Epileptics usually give evidence of some pre-existing constitutional derangement	V The healthiest women are more often attacked
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From this parallel it will be perceived that epileptic and puerperal convulsions nearly agree in the form of attack but differ in the manner of their incursion, and in the ultimate course they take, when these convulsions so nearly agree in their physiological characters it may seem difficult to make a distinction, and that the term "epileptic" applies to puerperal convulsions equally well as to the paroxysms of epilepsy. There is, however, an essential difference in their pathological aspect which might be more correctly described as the "Sthenic" and hyperæmic forms of convulsions respectively, and to avoid any blunder in the course of treatment puerperal convulsions is a form of apoplexy although it appears more perplexing when the morbid changes found in the *post-mortem* room exhibits a difference in the condition of the brain, since even if no effusion appears in either, unusual distensions of the veins is the only morbid change common to both and even this may be absent in puerperal convulsions. It is a mistake on the right side if apoplexy and puerperal convulsions be taken for each other as to the line of treatment rather than be mistaken for puerperal epilepsy. The causes of puerperal may be considered in two points of view the remote or predisposing cause, and the proximate or exciting cause. They have been also classed as "centric" and "eccentric" causes. The former being those that act directly on the nervous centres, the latter such as operate upon it indirectly through the agency of some distant organ. Impure blood, for instance, is a "centric" cause of convulsions, because it is supposed to be a direct irritant of the medulla oblongata, irritation of the stomach, intestines, bladder, or uterus, are "eccentric" causes, because the nerves of the affected organ communicate the

irritation to the spinal system, which reflects it in violent convulsive paroxysms. The predisposing causes of convulsions are hyperæmia, anæmia and toxæmia.

In hyperæmia if the circulation be excited, an irritant, that at another time would have no effect, may under such circumstances cause convulsions, an indigestible meal, for instance, or an excess in spirituous potations have brought on an attack, so also in such habits the action of the uterus, especially when powerful, has induced convulsions.

In anæmia, as in cases of extreme hæmorrhage, the same effect is produced, sometimes without any direct irritation, but if the uterus be exposed to any new excitant, as the introduction of the hand to turn the child or to remove the placenta, convulsions are frequently the consequence.

In toxæmia, albuminuria we know produces renal convulsions, and we have it on the evidence of Professor Simpson (*Edinburgh Monthly Journal*, November 1843) to prove that it predisposes to puerperal convulsions.

Epilepsy has been thought a predisposing cause of puerperal convulsions, but this has been disproved by high authority, in fact (Hardy and McClintock on Midwifery) and Dr Tyler Smith (*London Journal of Medicine*, Vol II) after discussing from all points conclude that it does not appear that females who are subject to epileptic fits are more liable on that account to attacks of puerperal convulsions, on the contrary, it would seem that they enjoy an exemption, and even the epileptic attacks occur with less frequency, and with a mitigated severity, during pregnancy. Indeed pregnancy and labor have the effect rather of suspending than exciting these attacks.

To summarise this case it will be observed from an analysis of the symptoms detailed, the history of patient, her general physique, previous good health, no plethora, anæmia, or albuminuria, that there were no apparent predisposing or current exciting causes present to induce the attack. No premonitory or suspected indications to usher it in, such as an "Aura," neither was there any repetition of convulsions, beyond some twitching of the face. The features were symmetrical and didn't express any paralysis on either side nor were there signs of body paralysis, hemiplegia or otherwise. The uterus had not been subjected to prolonged or powerful contractions to cause reflex irritation, and patient's natural demeanour was always of a calm and controllable nature. She had not sustained any accidental injury and the functional change in her urine three weeks or a month before is too insignificant to be considered in regard to toxæmia, and that mysterious expression idiosyncrasy offers no solution of cause. It is possible owing to the presence of a large child and the uterus being well stretched in its long oblique

axis, while the pains were too feeble or not strong enough to facilitate an earlier expulsion there may have been some obscure centric or mental impression or "eccentric" reason as just described in connection with the uterus.

A Mirror of Hospital Practice.

TUMOUR OF THE LEFT CAUDATE NUCLEUS AND FRONTAL LOBE

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THE following case of a glio-sarcoma of the caudate nucleus and prefrontal lobe of the right side appears to us to be of sufficient clinical interest to be put on record, not only on account of the difficulty of arriving at a definite diagnosis, but also on account of the peculiar set of signs and symptoms exhibited by the patient.

The degree of difficulty in the localisation of tumours of the cerebrum varies with the site, and this difficulty is very much greater if the tumour should be situated in those parts of the brain to which the name of "silent areas" has been applied. The prefrontal lobe has generally been considered one of these areas. It has been pointed out by many observers that a lesion of the frontal lobe does give rise to a fairly well-defined group of symptoms. In a most interesting and instructive paper in the *Lancet*, February 8th, 1902, Drs Elder and Miles have recorded a case of tumour of the left prefrontal lobe successfully removed by operation, and they have fully discussed the diagnosis and symptoms observed in their case. The perusal of this paper gave great assistance in arriving at an opinion of the true nature of the condition of our patient. The symptoms observed in lesions of the frontal lobe they consider to be produced by "an interference with inhibition, with attention and with judgment which are probably the highest functions of the brain, rendering man pre-eminent amongst living creatures."

The patient, a Scotsman, aged 35 years, was an engineer in charge of a steamer on the voyage from England to Calcutta. All the history obtainable was that on the way out, he appeared to be very forgetful, careless regarding the performance of his duties and personal appear-

ance, all his desires were covered by the two words, food and sleep. There was no history of syphilis, alcohol or mental trouble.

On the arrival of the ship in Calcutta on 20th February 1904, the patient was admitted into the General Hospital for pain in the right side of the head and fits of giddiness. He was found to have some loss of memory particularly with regard to recent events, and to have lost in a great measure all sense of decency and shame. While in hospital he improved to some extent and left to rejoin his ship, but took ill immediately again and was brought to the Medical College Hospital and admitted on April 5th, 1904.

On admission the patient—who was a strong, powerfully-built man—was very dull and slept practically all the time, he could be roused easily enough, but was very slow in answering questions, and evidently could not keep his attention fixed on any one subject for any length of time. On being left alone he immediately went to sleep again. On being questioned where he then was, he always answered "In the General Hospital," although repeatedly informed that he was in the Medical College Hospital, thus showing the loss of memory. Hearing was normal, there was no aphasia, cerebation appeared slow and deliberate. Reading and writing could not be tested as he refused to oblige us.

There was paresis of the lower part of the face on left side and left arm and leg, no sensory symptoms, reflexes were lost, no ankle clonus, no trophic disturbances.

The patient could only walk a few steps and then by throwing most of the weight of the body on the right side, he was distinctly unsteady in his movements, and he shewed a great tendency to fall to the right on sitting up in bed or in attempting to walk.

He complained of headache all the time, which was limited to the frontal region of the right side. The skull over the right frontal was painful and tender on percussion and appeared slightly swollen. There was no real involvement of the sphincters of the rectum and bladder. No vomiting, bowels constipated, no optic neuritis.

He still took a lively interest in his food although tasteless, and apathetic to a marked degree regarding everything else.

Circulatory system. Heart normal, pulse slow and regular, of moderate tension, no signs of atheroma.

Temperature 98° and remained normal until after the operation.

The other systems were normal.

Progress of the case. There was a steady increase in the dulness and apathy. On the 8th April he passed urine and feces in the bed probably not from any real loss of control of the

sphincters, but from carelessness regarding the impropriety of doing so. On the 12th April his bowels were moved with difficulty, and he began to have difficulty in swallowing. By the 19th April the lethargy passed into stupor, and he could only be awakened with great difficulty, all desire for food also seemed to have gone.

The paresis did not become any way marked, and there was never any real paralysis. The tenderness and boggyiness over the right frontal region increased and he always winced on percussion over it.

The chief points on which we had to rely for a diagnosis were, headache, giddiness, loss of memory, loss of modesty and sense of decency, slight paresis of left lower face, arm and leg, tastelessness and apathy, slowness of pulse with persistent normal temperature and tenderness over right frontal region.

Speaking generally a picture such as this points to increased intracranial pressure.

The diagnosis had to exclude hæmorrhage, embolism and softening, dementia and atrophy of the brain, and abscess.

I Against hæmorrhage we had—

- (1) The gradual development of the symptoms.
- (2) The loss of memory and mental symptoms developing first.
- (3) Absence of any associated lesions, e.g., albuminuria, high tension pulse, hypertrophied left heart, atheroma, &c.

II Softening due to embolism or thrombosis

Embolism is excluded for the same reasons as hæmorrhage and the absence of any endo-carditis or septic condition still further supports its exclusion. Thrombosis may be excluded from the absence of any history of syphilis, starvation, malaria, no general paralysis of sensation or motion, age of the patient.

III Dementia and gradual involution of the nervous system, beginning in the psychical centres with loss of memory, might have explained the case, but the history of the case and the short duration of the symptoms were sufficient to exclude dementia.

IV Against abscess we had—

- (i) No evident source of infection, ear disease, pyæmia, &c.
- (ii) Persistent slowness of pulse with normal temperature.
- (iii) No history of injury, &c.

V Tumour —In favour of tumour we had—

- (i) The gradual onset and steady increase in severity of the symptoms indicating a gradual increase in intracranial pressure.

- (i) The persistent headache, slow cerebration and lethargy
- (ii) Slowness of pulse with normal temperature
- (iv) Paresis of the left side of the body

Against this view was the fact that some of the most important signs of tumour of brain were absent, more particularly vomiting, optic neuritis and loss of reflexes in what was considered a lesion of the upper motor segment

With regard to the locality, we had the following localising points—

- (i) Paresis of left lower face, arm and leg
- (ii) The peculiar mental symptoms
- (iii) Headache chiefly confined to right frontal region
- (iv) Tenderness and boggiess of the same region

The paresis pointed to an implication of the fibres passing from the Rolandic area to the internal capsule, and as the paresis was very imperfectly developed, we considered the pressure of the tumour backwards was limited. That the cortex was not involved was evidenced by the fact that there were no convulsions, no ama, no epilepsy

The peculiar mental symptoms, loss of memory, apathy, loss of sense of shame, loss of inhibitory power—we thought to be strong evidence of the lesion being situated in the frontal lobe. All these symptoms are intimately associated with abolition of the functions of the frontal lobe and are largely due to a loss in the power of inhibition of the individual so that the patient is reduced almost to the condition of an animal deprived of its cerebrum. These points are exceedingly interesting in our case, as from a perusal of the literature of the subject, one would be inclined to consider the left prefrontal region of more importance than the right as far as the above functions are concerned, at the time we took pains to make sure that the patient was right-handed. Allen Star from a study of the cases recorded of this region concludes "The form of mental disturbance in lesions of the frontal lobe does not conform to any type of insanity. It is rather to be described as a loss of self-control and a subsequent change of character. The mind exercises a constant inhibitory influence upon all action, physical and mental, from the simple restraint on the lower reflexes such as the sphincters to the highest control over the complex reflexes such as emotional impulses and their manifestation in speech and expression. This action of control involves judgment and reason, the highest mental qualities. Thus we would expect the partial destruction of the frontal lobes to be accompanied by errors of judgment and reason of a striking character. One of the first manifestations would be a lack of that self-control which

is the constant accompaniment of mental action and which would be shown by an inability to fix the attention, to follow a continuous train of thought or to conduct intellectual processes. It was this very symptom that was present in one half of the cases collected. It did not occur in lesions of any other part of the brain

The absence of vomiting in our case may be due to the fact that the tumour was situated so far forward as the nearer the tumour is to the vomiting centre in the medulla, the greater the tendency to vomit. Our patient was examined for optic neuritis on admission before the increase in intracranial pressure was well marked which may account for its absence

On the above evidence a definite diagnosis of tumour of the frontal lobe of the right side was made, and the patient was transferred to the surgical side with a view to operation. On the 21st April Dr Thurston opened the skull over the area of the tenderness, and further than an evident increase in intracranial pressure nothing abnormal appeared on the outer surface of the brain. An incision was made in the cortex and a finger gently inserted and the brain around gently and carefully palpated for any mass but nothing found

Although nothing could be discovered during the operation of the nature of a tumour, the diminution of the intracranial pressure alleviated the more pressing symptoms

Consciousness returned and the patient could answer questions, and he made marked use of his arms, wiping his mouth with the sheet after coughing. He still passed urine and feces in bed

Next day, the 22nd, there was a good deal of coughing and expectoration. He again tried to undo the bandages. He vomited and the temperature rose to 101.5°

On the 24th April he became unconscious, temperature 103.2°

He never recovered consciousness and died on the evening of 26th April

Post-mortem examination

The following was the condition of the brain —

- (i) Right ventricle distended with fluid and dilated anteriorly bulging forwards into the frontal lobe
- (ii) The floor of the right ventricle shewed a reddish-brown tumour of the corpus striatum projecting into the cavity of the ventricle and pushing the third ventricle over towards the left
- (iii) The left ventricle contained excess of cerebro-spinal fluid
- (iv) Nothing else abnormal found.

The tumour was a glio-sarcoma of the caudate nucleus rapidly growing and projecting into the frontal lobe pressing on and infiltrating the bundles of fibres coming from the frontal lobe to the internal capsule. The posterior part of the tumour was pressing on the internal capsule and would thus account for the motor paresis. The greatly increased amount of cerebro-spinal fluid with the accompanying increase in intracranial pressure explained the gradually increasing stupor. The severed connections of the frontal lobe with other parts of the brain would assist in explaining the mental condition of our patient. Our reason for recording this case is to add another to the list of lesions of this region already reported where it has been possible to localise the site of the lesion before death.

PRIMARY CARCINOMA OF THE LIVER IN A BOY OF 19 YEARS

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JADAV, a Hindoo boy, aged 19, an inhabitant of the district of Chapra, was admitted into the Medical College Hospital, Calcutta, on 12th July 1902. He was complaining of a painful swelling in the hepatic region. About three months before his admission, he first began to feel a lancinating pain of a somewhat constant character in the right hypochondrium, which was soon followed by a swelling which began to increase gradually. On inspection, the increased liver presented the appearance of a distinct abdominal tumour with several round irregular prominences, which moved up and down with respiration. The liver dullness extended from the lower border of the 4th rib to about $\frac{1}{2}$ inch above the iliac crest. The superficial veins of the abdomen were somewhat distended, but there was no ascites. No distinct nodule could be detected round the umbilicus. He had no jaundice, but was markedly cachectic. On palpation, the liver was slightly tender and the tumour felt very hard to the touch. There was no adhesion between the liver and the abdominal wall, which was quite free from the nodular prominences. The urine gave slight reactions of bile, and on microscopical examination, crystals of leucine and tyrosine were found. Temperature was normal. There was slight impairment of resonance in both the lungs specially at the bases with an increase of vocal resonance in these parts. Expectoration was mucoid and somewhat yellowish in colour. One or two glands near the clavicle were somewhat enlarged. Nothing else abnormal was detected in any other part of the body.

From the extreme rarity of cancer at such a young age, it was suspected to be a case of primary sarcoma of the liver.

Four days after his admission into the hospital, the patient died on 16th July 1902 at about 11 A.M.

Post-mortem examination was made three hours after death by Dr L. Rogers, Professor of Pathology, Medical College of Calcutta.

Rigor mortis was still present.

On opening the thorax, the pleurae were found adherent to the bases and the posterior parts of both the lungs. Some yellowish hard nodules could be seen on the surface of the lungs, which on section showed yellowish masses. All other structures in the thorax were normal. On opening the abdomen, a large tumour was found displacing the right kidney downwards to a considerable extent. Running obliquely down in the lower part of the tumour was the transverse colon. The large tumour apparently consisted of the enlarged liver with many hard and irregular prominences on its surface. A mass of enlarged glands was found in the portal fissure. Many other secondary nodules were scattered in the liver substance, which on section showed yellowish masses, together with a few hæmorrhagic patches. The weight of the liver was 6 lbs. Gall-bladder contained the usual amount of dark-green bile. All other internal organs of the body were quite normal.

On a microscopical examination of these nodules, they were found to be distinctly carcinomatous in character, and the sections of the liver showed distinct columns of epithelial cells, with evidences of fatty degeneration in the yellowish masses. The secondary nodules in the lungs showed similar epithelial cells. It was therefore diagnosed by Dr Rogers as a case of duct cancer of the liver.

Remarks—The chief interest of the case is its extreme rarity. Dr Hale White, in his article on Tumours of Liver in Albutt's System of Medicine, Vol IV, writes after a careful examination of the records of Guy's Hospital, "During the years 1870—1893, both inclusive, 11 cases of primary carcinoma of liver has been seen in *post-mortem* room, and about 115,000 *post-mortem* examinations have been made." Among these 11 cases, in one instance recorded by Dr Pye Smith, cancer occurred in a young boy, aged 12, whilst in the remaining 10 cases the oldest patient was 71 years old and youngest 23. Then of seven cases recorded in the Pathological Society's Transactions from 1871 to 1891, and not included in the 11 cases from Guy's Hospital, the oldest patient was 69 years and the youngest 33. We then see that it is a disease of adult life. But our present case is another rare instance where primary cancer of liver occurred in a young boy of 19 years of age.

Indian Medical Gazette.

AUGUST, 1905

RESEARCH IN TROPICAL DISEASES IN INDIA

ONE of the first fruits of the appointment of Lieut-Colonel J W Leslie, M.B., I.M.S., as Sanitary Commissioner with the Government of India, is the Government Resolution which we quote below, which announces the long-looked-for establishment of a Central Research Laboratory at Kasauli, and the scheme for similar laboratories in all the provinces of India. We look with great hope and interest to the work which will be done in India by these laboratories, and we see no reason to doubt that in course of time they will attract workers from all parts of the world.

What we should like to see established in India is an Imperial School of Tropical Medicine. The material is here in India and not in London, Liverpool, Paris or anywhere in Europe or America. Post-graduate classes established in connection with the unrivalled clinical material available at any of the large Medical Colleges at Calcutta, Bombay or Madras, and worked in connection with the provincial laboratories and the now established Central Research Laboratory at Kasauli should attract workers from Europe and from the Farther East. A three months' course of clinical work in the hospitals in any of the Presidency towns, combined with another three months' course in the Central Laboratory would be an education in tropical medicine which no other country could equal, and one which would be invaluable to workers intended for our colonies, as well as for men intending to practice in India. If every I.M.S. officer were sent to such a course for six months after landing in India, the experience would be worth a dozen Netleys or Staff Colleges in London.

We print herewith the Government of India Resolution —

"A scheme for the provision of more adequate means for the scientific study of the etiology and nature of disease in this country has recently occupied the attention of the Government of India. From time to time various plans have been discussed, but financial and other difficulties have hitherto prevented the adoption of a complete scheme, while there has lingered a doubt whether in the peculiar circumstances of this country it would be possible to make India self-supporting in medical and sanitary research. The financial difficulties,

happily, have disappeared and the brilliant work done in the past by some of their officers in circumstances of great difficulty, and the successful administration of the Pasteur Institute at Kasauli, lead the Government of India to hope that if the means are supplied they will obtain from among their officers a staff of scientific workers worthy of the problems that confront them. When the new scheme is developed it should no longer be necessary for officers to go from India to Europe to study the bacteriology and parasitology of tropical disease, and it may be expected that workers from Europe will seek Indian laboratories to avail themselves, under competent direction, of the unrivalled material for study which the diseases of this country afford.

In brief outline, the scheme of the Government of India comprises the establishment of a Central Research Institute at Kasauli, and a laboratory for scientific, medical and sanitary work at the headquarters of each Provincial Government. The functions of the central laboratory will be original research, the preparation of curative sera for the diseases of man and the training of scientific workers. The functions of the provincial laboratories will be primarily the provision of expert assistance for the provincial, medical and sanitary officers, but the superintendents of these laboratories will be encouraged, so far as opportunities allow, to prosecute original research. The Central Research Institute will be located at Kasauli, which possesses advantages over any other place which has been suggested to the Government of India. Kasauli has a temperate climate, is easy of access by rail, is the site of the Pasteur Institute (while there are large hospitals at no great distance), and is conveniently near the headquarters of the Government of India and the Sanitary Commissioner under whose administrative control the Director of the Institute will work. Most of the provincial laboratories are already in existence, although some of them must for the present undertake work which will be carried on elsewhere when the general scheme is mature. At Guindy there is the admirable institute called into existence by the efforts of Lieutenant Colonel King, after whom it has been named. Here, in addition to general research work, vaccine lymph is prepared, and it may be considered desirable by the Government of Madras to manufacture curative sera also. At Bombay, the plague research laboratory will eventually become the provincial bacteriological laboratory, but during the persistence of plague the manufacture of the prophylactic will be continued here, as well as research in connection with the disease. In Bengal there is a bacteriological laboratory attached to the pathological department in the Medical College, Calcutta. In the United Provinces there is Mr Hankin's well-known laboratory at Agra, where the bacteriological and medico-legal work for the United Provinces and Central Provinces is carried on. In Burma a similar laboratory is about to be opened at Rangoon. In both cases eventually separate arrangements for medico-legal work will be made. In the Punjab no bacteriological laboratory has as yet been provided, and for the present the Government of India think that the Pasteur Institute at Kasauli may suitably undertake the routine work for that province on such terms as may be arranged. The Pasteur Institute

at Kasauli, with the exception noted above, and the Anti-rabic Institute about to be opened at Coonoor, in Southern India, will be restricted to work in connection with the prevention of rabies.

The scheme has the approval of the Secretary of State, and the Government of India propose to appoint as the first Director of the Central Research Institute Lieutenant-Colonel Semple, M.D., R.A.M.C., (retired), whose successful administration of the Pasteur Institute of India has marked him out as possessing the zeal and capacity to make the institute in all respects fit for the great task that lies before it.

LONDON LETTER

THE LAST OF NETLEY

THE Army Medical School at Netley has been finally closed, and no officers entering the Royal Army Medical Corps or Indian Medical Service will, in future, be sent to the Royal Victoria Hospital, Netley, for instruction. The hospital will still subserve an educational purpose for nurses and orderlies, but the instruction of medical officers will be conducted in the Royal Army Medical College at Millbank and at Aldershot. The hospital at Millbank in which clinical instruction in military medicine and surgery is to be given has now been completed, and the college buildings adjoining it are in active progress. The final closure of the Netley School was marked by a distribution of prizes on the 31st of May, at which Surgeon-General A. M. Blandford, C.I.E., President of the Medical Board at the India Office, presided. Since the year 1902, the school has been attended only by officers of the Indian Medical Service, officers of the Royal Army Medical Corps being sent, after the expiration of the London Course, which has been open to both, to Aldershot. Future arrangements have not as yet been definitely settled, but it is understood that the advantages of the Royal Army Medical College will, as hitherto, be shared by both services. The proceedings at Netley on the 31st of May have been fully reported in the leading medical journals. Surgeon-General Blandford made some appropriate and sympathetic remarks, and the occasion was felt by those who were present to be an interesting and sad one, and will no doubt arouse in the heart of every member of the Indian Medical Service, to whom Netley was the portal of his service life, similar recollections and regrets. The Army Medical School was a new and important departure and has fulfilled a useful purpose. It is to be hoped that the college which has taken its

place and is intended to perpetuate and develop its aims and objects will attain a long and prosperous future.

REMINISCENT AND VALEDICTORY

The closure of the Netley School signifies the termination of my own active professional life. Other and more general interests will occupy what remains to me of life. I shall lose touch to a large extent with current medical literature, discovery and work, and I have been forced to the conviction, that I can no longer with profit continue to indite these letters in which I have striven to convey to the East some reflection of the passing rays of research and thought which illuminate the field of medical and scientific industry in the West. To sever my connection with the *Indian Medical Gazette* is to me a cause of regret and pain. The only consolation is that it would be still more regretful and painful to realize that my effusions were degenerating into senile twaddle. The starting of the *Indian Medical Gazette* was coincident with the commencement of my service in India, both occurring in January 1866. Since then, as contributor and editor, I have been in continuous and close connection with the journal which has necessarily entered largely into my intellectual life. The paper was for a long time unfortunate in its publishers. The firms which owned and issued it were decadent and impecunious, and for some twenty years its existence was rather precarious. Without the support of the Government of India it would have collapsed, and there was a dismal lack of enterprise and liberality in its management. It was through the wise intervention of Colonel L. A. Waddell, M.D., C.B., who acted as editor in 1884-5, during my absence on furlough, that matters were placed on a more satisfactory and stable basis. He bought the paper and entrusted its publication to the substantial and pushing firm which now owns it. Medical Journalism has difficulties to encounter in India, which are unknown in other countries. The clientele is limited, and the apathy due to climatic conditions, the temporary residence of service medical men and the absence of keenness and progressiveness in the indigenous profession is obstructive to success. Medical periodicals and medical societies have accordingly had for the most part a short and fitful tenure of life, and an existence of nearly forty years is as unwonted as it is creditable. It is also to be noted that editors have been burdened with

duties of an official and private nature of such a kind and amount as to compel them to devote to the duty of editing only such fraction of their time and attention as could be snatched from other and very onerous duties exacting a prior claim on their services. The two first editors, D Boyes Smith and J Purefoy Colles, were employed in the Medical College and College Hospital. The next two, C R Frances and J F C Ross were Secretaries in the Medical Department when the whole of the medical administration of the Bengal Presidency, both Military and Civil, was transacted in the office of the Surgeon-General. C Macnamara was Professor of Ophthalmic Surgery and Superintendent of the Eye Infirmary and had a large private practice in Calcutta. During the twenty two years of my editorship, I was loaded with labours and responsibilities, official and otherwise, which left very little time for editorial pursuits, and those who acted for me during furloughs and have edited the journal since I left India, have been in a similar plight. The wonder, therefore, is that the *Indian Medical Gazette* has contrived to survive so long under circumstances so embarrassing. The explanation of the matter is simply the existence of a laudable spirit of professional activity and of a constraining impulse on the part of medical men serving in India, to promote medical science, to teach and be taught to bring their experiences and thoughts into light for the purpose of testing their value by passing them through the crucible of publication and discussion. Of the quickening of this spirit and impulse the pages of the *Indian Medical Gazette* exhibit growing proof as the years roll on, and the journal has actively responded to and reflected that most remarkable wave of progress which has of late years characterised the study of tropical diseases of which it constitutes the prominent exponent. It is to the spontaneous, and I may add, unremunerated, efforts of the medical services that the *Indian Medical Gazette* owes the degree of success which it has attained as an organ of representation of medical work and thought. The subordinate services have helped to some extent, but the indigenous profession has been for the most part silent and inactive. The native practitioner is receptive and imitative, but not inventive or progressive. He is apt to contemplate his calling as a business rather than a mission. Many members of the profession are highly gifted and skilled and devoted to their work, but the time

and opportunity have apparently not arisen for devoting themselves to original investigation or contributing to scientific elaboration. Let us hope that it will not always remain so. The journal having from its birth onwards depended largely, if not mainly, for its existence on Government support, and being throughout its career principally indebted to members of the services for its contents, its politics and tone constitute a curious feature. From the first it assumed and up to the last it has maintained an independent attitude, inclining perhaps, as might be expected, to partiality to and advocacy of the interests of the Indian Medical Service. The administrative re-arrangements rendered necessary by the assumption by the Queen of Indian administration after the mutiny deprived the Indian Medical Service, whose very existence was for a time in jeopardy, of place, prestige, power and pay. These changes were criticised in the earlier volumes of the journal with freedom, if not ferocity. The formation of a Sanitary Department robbed the Medical Department of status and prerogative and was bitterly resented. As the earlier editors of the journal were Secretaries in the Medical Department, it is not surprising that the sore feeling caused by this segregation found somewhat bitter expression, and the prejudices thus arising were slow to subside and perhaps to some extent tinctured, if not prompted, the somewhat acid criticisms to which the proceedings and views of the Sanitary Department were occasionally subjected. It is satisfactory to find that the element of medical politics and polemics has been gradually assuming a less conspicuous place in the conduct of the journal, and that the true function of a medical paper, as an exponent of medical work and thought, has been gaining in prominence. As might be anticipated, the material contributed to the journal has been predominantly clinical, the outcome of men's observation and work in hospitals. The opportunities and means of special and systematic research have not up to recently been in existence in India. The profoundly interesting account of his work which Major Ronald Ross has contributed to the *Royal Army Medical Journal* shows how he was hampered and hindered by service requirements and orders in carrying out a research which has revolutionised our conception of the most disabling and destructive of tropical diseases. With the establishment of laboratories and the

recognition of the need of systematic inquiry into the nature and causation of disease, a new day has dawned upon medical science in India, and the complexion of the *Indian Medical Gazette* has undergone a responsive change. With the fervent hope that the medical profession in India, in all its departments and branches, will rise to the inspiration of this new scientific impetus, and realise, in ever-increasing measure, the true meaning and object of its existence and office, I write that tender and hopeful word 'farewell'.

KENNETH MCLEOD

Dated 15th June, 1905

Current Topics.

MEDICAL PROGRESS IN THE UNITED PROVINCES

THE triennial report on the working of the hospitals and dispensaries of the United Provinces which was submitted by Colonel C H Joubert, M.D., F.R.C.S., I.M.S., just before his retirement, is a document of more than average interest and importance.

The most important matter referred to is the short supply of civil hospital assistants, not that the number of applicants is short, but that the Agra School has to refuse numbers of would-be students owing to the inadequacy of the accommodation. At present the output of this school only replaces ordinary casualties, yet the department has had to supply men for plague duty, for service in Burma, and an increasing number of military students. We are glad to see that the Government of the United Provinces recognises the urgent necessity of considerably enlarging the Agra Medical School, and Sir James La Touche goes further and considers that matters will not be satisfactory till a Medical College is established for training of Assistant-Surgeons also. At present most of the Assistant-Surgeons are educated at the Lahore College, and an admirable class of man is turned out from that school.

We are glad to see that Government have given one lac of rupees to provide better equipment and instruments for the various dispensaries. This was certainly well spent money.

Much has also been done, writes Colonel Joubert, to improve the operating rooms of the mofussil dispensaries, and as usual Civil Surgeons have been very energetic in collecting funds for the improvement of their hospitals.

Any one who remembers the condition of the mofussil dispensaries, in most provinces, a dozen years ago, will agree that there has been a marked progress and that very much has been done to bring these hospitals and dispensaries up to modern requirements.

The following is a list of the new hospitals completed or in progress in the United Provinces —

"Amongst these may be mentioned the following —

Lucknow — A hospital for Europeans in connection with the Balrampur Hospital, built at the cost of the Maharaja of Balrampur. This meets a great want as it is constantly full and is an excellent institution.

Cawnpore — A similar hospital for Europeans has been constructed and is ready for occupation. It will prove a great boon to the European population connected with the numerous Cawnpore mills.

Agra — The new Lady Lyall Female Hospital has been completed and opened, a most important institution of the most modern type. The old female hospital has been converted into an eye hospital, and, with a spacious outpatient department, formerly the class room for female students, will prove a very valuable addition to the requirements of the Agra Medical School.

Benares — A very large addition is being made to the Ishwari Female Hospital, the best and most useful female hospital in the Provinces.

Allahabad — A large addition has been made to the Colvin Hospital, and the interior arrangements have been remodelled, and a new operating room is about to be constructed. A new civil hospital for Europeans is in progress and will be completed during the current year.

Mirzapur — New wards have been added, a new operating room built, and a small private hospital for natives of the better class. The internal arrangements of the former buildings have been improved.

Moradabad — The old hospital being most defective and inconvenient an entirely new hospital of modern design has been sanctioned and is about to be commenced. The Municipality, the District Board and Government have been most generous in providing an admirable site and a large allotment of funds, over a lac of rupees.

Oras — An entirely new Sadr Hospital is in course of construction.

An European Cottage Hospital was opened in April 1903, at Muesoorie, for European and Eurasian sick unable to afford at their homes the cost of medical treatment and nursing.

The project was initiated and carried through by the Civil Surgeon, at the time Major Alpin, I.M.S. The general public of Muesoorie contributed liberally towards the initial expenses and annual support, and such patients as could afford to do so paid hospital fees. The hospital was a distinct success from the first, 62 patients having been treated in the season of 1903, the income being Rs 10,329 and expenditure Rs 6,702, the year closing with a cash balance in hand of Rs 3,627. During the season of 1904 from 15th March to November, 43 patients were admitted of whom 10 were cases of enteric fever. Three deaths only occurred, none from enteric fever. The income for the year, including the above-mentioned credit balance was Rs 10,721 of which Rs 3,785 was from patients. The expenditure was Rs 7,019 and there was a closing balance to credit of Rs 3,702. The hospital meets a distinct want.

Referring to Statement G, in which are detailed the number of surgical operations performed Colonel Joubert writes, that speaking as a surgeon himself the present list of selected operations is not a good one and requires modification. It contains printed columns for operations very rarely performed even in large hospitals in Europe, it includes trivial and important 'tumours' under one heading, there are no headings for important modern operations, and no blank spaces for mention of special operations.

On the important question of the inspection of outlying district dispensaries Colonel Joubert writes —

"Cases of failure to visit all their dispensaries once a quarter have been explained by Civil Surgeons. There are many outlying branch dispensaries which Civil Surgeons can only reach in the hot weather and rains by undergoing extreme discomfort and risk. With the yearly increasing number of branch dispensaries the four inspections a year rule becomes in some districts increasingly difficult to carry out. I think more freedom of action should be allowed to Civil Surgeons, as the Inspector General controls their inspection work by means of their inspection reports, and the power of visiting more frequently dispensaries requiring special attention and less frequently others should be allowed, within certain limits. Agra, Allahabad and Lucknow, all with very heavy station work, have each about ten branch dispensaries, Grahampur another heavy station has nine. But by G.O. No 91/V—677B of 22nd March 1904, the assistants to the Civil Surgeon of Lucknow and Allahabad are now permitted to inspect branch dispensaries when the Civil Surgeons are unable to do so themselves. There are on the other hand some small districts where the Civil Surgeons' station work is very light, which have only two or three branch dispensaries. But the same rule applies to the officer in charge of these as to the Civil Surgeon of Agra with all his important medical school and station work. The rule may not be considered by Government an abso-utely hard and fast one but it exists, and medical officers, who fail to pay their four inspections a year to all their dispensaries, have to give their reasons and feel that they have not carried out their duties."

The following note is also of interest —

"The relaxation of the Provincial rule by which a Civil Surgeon lost his lien on the civil station from which he took furlough has been followed during the years 1903 and 1904 by the excellent result that a considerable proportion of the senior officers holding good appointments have taken long furlough and have had the much needed opportunity of putting themselves in line with modern progress in Europe. It is essential for medical officers, however good they may be, to see as often as possible the work of other men in England. The rule formerly in force in the United Provinces was a fatal bar to this."

The report is a valuable one shewing a large amount of good medical and surgical work done by Civil Surgeons in the United Provinces.

The Government Resolution on the report is an indication that the Lieutenant-Governor is alive to the medical needs of the Province and determined to set medical education there on a satisfactory footing.

THE PLAGUE BACILLUS IN THE PERIPHERAL BLOOD

THE question of the finding of the bacillus pestis in the peripheral blood in the early stages of the attack is one of obvious importance (see Simpson's *Treatise*, p. 289). We therefore quote the following from the report of Dr. W. V. Koch on the Hongkong Plague Hospital —

"Since we have become familiarised with using for diagnostic purposes a thick blood film decolourised and stained with a basic dye, as was first adopted here by Dr. Bell, there scarcely has been any hesitation in naming as the plague bacillus all organisms that showed a bipolar reaction, and diagnosing as plague any case in

whose blood films, prepared thus, these organisms were found. Such a method of diagnosis is far too summary. This cannot be too strongly pointed out and insisted upon. Bipolar organisms, fairly commonly distributed, exactly like the bacillus pestis microscopically, are very easily mistaken for it. Should a patient present the clinical symptoms of plague and a bipolar organism be discovered in the blood we might safely infer without further tests that it is the plague organism. Should on the other hand a bipolar organism be found in a blood film or a smear, and the person shows no other sign suggestive of plague, the presence of the organism is most evidently a contamination. Cases have been diagnosed as plague from the presence of this bipolar organism in a blood film without especial reference to clinical symptoms, and mistakes have occurred even when the greatest pains and care have been taken to avoid the possibility of contamination. The diagnosis of plague is a very important matter and should be based upon a clinical as well as a bacteriological diagnosis, and not upon a microscopic diagnosis alone. In the case of the lower animals equally great care should be taken, and no positive opinion can be accepted unless every bacteriological test has been thoroughly worked out and experimental proof obtained. Otherwise the diagnosis not only violates scientific deductions and accuracy, but, what is, perhaps an equally grave matter, it causes a scare with regard to fresh sources of infection. It should therefore be recognised that the presence in a blood film or smear from any tissue or organ of a bipolar staining organism does not necessarily mean *per se* that that organism is the bacillus pestis. During an epidemic of plague or when the patient presents the clinical symptoms of the disease we may safely conclude that bipolar organisms found in such films are true bacilli pestis assuming of course that every care and precaution has been taken in making the film so as to avoid contamination. On the other hand the absence of the bacillus pestis from such films does not negative the diagnosis of plague when clinical symptoms are present.

It is generally accepted that the bacillus pestis is found in the peripheral blood immediately preceding death, but later researches here shew that it may be found also at any time during the course of the illness, thus demonstrating the presence of the bacilli in the general blood stream practically immediately after infection. During the course of the year I paid some attention to this point and was struck with the varying results obtained, which I have summarised in Table No. X and which I shall briefly note here. I may premise that all the cases examined presented the classical clinical symptoms of plague, and that repeated examinations of slides were made in each case.

Detailing the results of my examination it will be noticed—

- (1) that the bacillus pestis was found in some cases during life, and also after death in all the organs—the heart blood, spleen, liver, lungs,
- (2) that in some cases (bubonic plague 6, septic 1) the bacillus pestis was not found immediately before death though it was found on several occasions previously during the illness,
- (3) that in other cases (10 of bubonic plague and 1 septic) no plague bacilli could be found during life but were found after death in the various tissues and organs,
- (4) that in 9 cases of bubonic plague and 1 of septic plague the bacilli were found at the first examination but not on subsequent examinations,
- (5) that in a case of bubonic and 1 of septic plague the bacilli could not be found either during life or after death,
- (6) that in 9 cases of bubonic and 3 of septic plague which recovered plague bacilli were found in blood films on their admission,

- (7) that in 17 cases of bubonic and 7 of septic plague the bacilli were found *ante-mortem*, no *post mortem* examination was made in these cases,
- (8) that in two cases I found the bacilli in the peripheral blood after convalescence had been fully established

It would seem natural to conclude from these observations that the presence of the bacillus pestis in the blood—the peripheral blood—is not constant, that it is not to be found on every occasion of examination in the course of the disease, nor is it present always immediately before death. It is undoubtedly a fact that the bacilli are always to be found in the bubo during its early stages, but when suppurative and necrotic changes are set up—when the bubo matures—they cannot always be found. It would seem that streptococcal infection has dominated the position, and that the swarm of leucocytes ingest the plague bacilli and either destroy them or render them inert. In emears from the spleen I was able to find the plague bacilli in the substance of the phagocytes, and in buboes which matured and suppurated I found the bacilli within the substance of the leucocytes, while the cocci of suppuration were free. What value is to be placed, as regards its infectivity, on the presence in the peripheral blood of convalescent cases of the bacillus pestis is doubtful. Whether the bacilli are always present in the blood of convalescents, if not always under what circumstances and in which variety of plague, and finally the length of time they persist after convalescence is established, are questions which require elucidation.

INTRA MUSCULAR INJECTIONS OF MERCURY

THIS method of the thorough treatment of syphilis we recently discussed in a review of Lieutenant-Colonel Lambkin's book on the subject. The method has been largely used in the Army, but we had heard but little of its use by civil practitioners till we came across the paper by Dr Henry Fitzgibbon, of the Dublin Lock Hospital, a well-known authority on syphilis. In the May issue of the *Dublin Journal of Medical Science* (p. 323, etc.) we find Dr Fitzgibbon's paper. He writes very favourably of the method, but points out, as does Lieutenant-Colonel Lambkin, the great necessity of attention to certain points. We quote his own words—

"In order to carry out the treatment without risk of misadventure there are two points of paramount importance which demand special care and attention. First, to be sure that the cream has been properly compounded and carefully preserved from deterioration or decomposition from exposure to the atmosphere or other influence which might contaminate it. Second, to the quality of the cream used, but in no way less essential to the success of the treatment, comes the manner in which the doses are administered."

With reference to the first point, Colonel Lambkin calls special attention to the care with which the lanolin and mercury must be blended together prior to the addition of the carbolic oil or parolin. This is a very troublesome and tedious process, and can be accomplished only by long continued trituration in small quantities in a glass mortar, by or under the personal supervision of some trustworthy person. Too much care cannot be taken in the trituration of the mercury and lanolin. When prepared it has hitherto been dispensed in suitable well stoppered bottles, but even when properly compounded and dispensed in this manner there is a risk, owing to the changes of temperature, of the mercury separating and gravitating to the bottom of the bottle, besides which, each time the bottle is opened for use there is a possibility of its

contents becoming contaminated from the atmosphere. The cream which I have been using has been compounded for me by Messrs Price & Co., of 26, Clare Street, (Dublin) under the personal supervision of the head of the establishment, and is perfectly satisfactory. At first I obtained it in wide mouthed stoppered bottles in quantities of not more than an ounce at a time, but I found considerable difficulty, particularly when it became low in the bottle, in drawing it up into the syringe, and the process of charging the syringe was not only difficult but dirty, and attended by waste, and it was impossible to avoid having a large bubble of air intervening between the end of the glass piston and the cream, which, unless completely expelled before the injection is made, constitutes, in my opinion, a grave source of danger. In order to obviate the foregoing objections I suggested to Messrs Price & Co. to dispense the cream in glass tubes containing min. xx or min. xxx in each tube, with a cork plug at each end. The plug at one end is driven home flush with the extremity of the tube, while the cork at the opposite end is allowed to project sufficiently to enable it to be withdrawn when the cream is about to be used. The cork at the opposite end is then pushed down by means of a small glass rod of suitable length, supplied for the purpose, and the contents of the tube are discharged into the cylinder of the syringe in the manner hereafter described. Messrs Price & Co. now supply these tubes under the registered name of "Jectols" in boxes of a dozen or more as required, each box containing a suitable glass rod to be used as a piston in the manner I have indicated. I have found that these "Jectols" not only afford a cleanly and expeditious means of charging the syringe, but also prevent the risk of air being retained in the cylinder. Mode of making the injection.—The gluteal or deltoid muscles afford the most convenient sites, and the skin, at the point where the injection is about to be made, should be thoroughly cleansed and well scrubbed beforehand with ether or absolute alcohol. The syringe used must be all glass, as it is impossible to ensure that a syringe with any packing on the piston is perfectly sterilised. The needle should be platinum-iridium of a specially large calibre, as the ordinary needles for hypodermic injection will not transmit the cream owing to its thickness. The syringe should be separated and sterilised by boiling, and the needles sterilised by being held in the flame of a spirit lamp after each injection, until any cream remaining from the previous injection is thoroughly burnt out after which the wire should be passed through to clear away any debris, and then a little alcohol squirted through to make sure that it is free. The syringe must be charged before the needle is attached, and if it is done by drawing the cream from a bottle great care must be taken to expel the bubble of air, which it invariably contains when filled in this manner, before the injection is made. Whenever they can be obtained it is much easier and safer to fill the syringe from a "Jectol," which is done in the following manner.—The plug for attaching the needle having been removed, the syringe is held in the left hand with the glass piston drawn back, and the cork having been withdrawn from one end of the "Jectol," the cork plug at the other end is pushed down with the glass rod so as to transfer the cream into the syringe. This is easily accomplished with the right hand while the syringe is held vertical in the left. When charged in this way there is no air in the syringe between the cream and the piston, and the air which is necessarily in it is all at the distal end, and is expelled directly as soon as the plug is replaced. The recently sterilised needle is then attached and the instrument is ready for use.

It is important the moment the needle is withdrawn that a piece of lint or muslin, soaked in absolute alcohol, should be placed on the puncture, and the part massaged for a few seconds so as to extravasate the cream through the muscular tissue at once, otherwise some of it may leak back along the needle track into the subcutaneous tissue or even escape through the puncture in the skin.

Finally, the puncture should be sealed by applying a little celloidin or Friar's balsam before being allowed to come into contact with the patient's clothes.

I have now done a very large number of injections with the precautions and in the manner I have described, and in no single instance has there been any local inconvenience or trouble whatever, when I have followed this method I do not think too much stress can be laid upon the importance of safeguarding against the possibility of any admixture of air with the injection."

THE DEVELOPMENT OF THE SPLEEN PARASITE

In No 15 of *Scientific Memoirs* Lieutenant S R Christophers, I.M.S., gives a valuable and interesting account of his work on the development of the so-called Leishman-Donovan bodies.

Lieutenant Christophers writes (p 4). "In the main I have been able to confirm Captain Rogers' results. Indeed most of the forms figured by him, including very elongate forms, have occurred in my preparations. In addition I have been able to observe certain further appearances not described by him, which appear to take place at a later date, and to add some details of description. On the other hand, I have been unable to accept his conclusions regarding conjugation of the large oval forms, or to be convinced that the nature of the bodies is yet finally settled."

In conclusion, Lieutenant Christophers writes "Although I have examined only a small number of cases, the results have been amply sufficient to corroborate the changes described by Captain Rogers. But although the presence of a nucleus and well-marked blepharoplast, and the development of a flagellum point to the bodies being a flagellate, I do not feel justified either from my own observations, or from an inspection of Captain Rogers' drawings in stating that they are trypanosomata. The relation of the flagellum to the large chromatin mass, even in the very elongate forms, does not suggest the characteristic arrangement met with in trypanosomes in process of development. On the other hand, it cannot be denied that the forms bear a very close resemblance to some of the developmental forms seen in cultures of *T. Lewis*, and further study must determine what relation, if any, exists between the new parasite and the trypanosomata of mammals."

We refer our readers to the report itself for details of the discoveries made by Lieutenant Christophers and for an account of the technique he has employed.

SPIRILLUM FEVER IN INDIA

The letter from Major C N C Wimberley, I.M.S., which appeared in our June issue (p 232) and the two letters we publish from Captain Turnbull and Lieutenant E A Walker, I.M.S., in our present issue, serve to direct attention to the presence of this protozoon in the blood of fever cases in India.

The recent observations of Schaudinn on the *Spirochaete ziemannii* found in the blood of the *Athene noctua* seem to have settled the proof of the protozoal nature of these organisms, and the recent announcement of the discovery by Metschnikoff of the *spirochaete pallida* as the cause of syphilis has directed fresh attention to these organisms.

The following spirochaetes has been described* —

- (1) *Spirochaete obermeyer*, which has long been known as the cause of relapsing or "famine" fever, a disease well known in many countries and one of which cases are constantly found in Bombay, and Captain Lamb, I.M.S., has recently shown that monkeys are susceptible of the infection.
- (2) *Spirochaete anserina*, an organism highly pathogenic to geese.
- (3) *Spirochaete gallinarum*, attacks fowls in Rio de Janeiro. The spleen and liver become much enlarged, and death takes place in a few days. The disease is conveyed by ticks of the genus *Aigas*.
- (4) *Spirochaete thaleri*, found in Transvaal cattle.
- (5) *Spirochaete ziemannii*, described as large fusiform parasite, found in the blood of *Athene noctua*. The general development is similar to that of *T. noctuae*, and they have a trypanosome stage.

Other spirilla have been found in cases of pyorrhoea alveolaris, a very common condition in Indians, where the care of the teeth is neglected, and James has described them in the scrapings of ulcers from dogs. Much has still to be done before we understand the real significance of these organisms, but a study of their occurrence will surely add to our knowledge of the important subject of the continued fever of India.

TYPHUS fever is one of the diseases practically belonging to pre-bacteriological days, and consequently text-book statements on its etiology are apt to be found not in accordance with modern views on the spread of disease. We observe that Professor M Hay, of Aberdeen, in a lecture on an outbreak of typhus in that city does not think the disease is so virulently infectious as was previously supposed, but inclines to the view that it is rather spread by fleas. The certain factors in its etiology are dirt and bad ventilation, in fact the disease has many analogies with plague.

THE anti-malarial campaign was conducted by the Italian Red Cross Society in the Roman

* See Stephens and Christophers' *Practical Study*, 2nd Ed., p 77, etc.

Campagna for five months in the year 1904. During this period prophylactic treatment was administered to 12,061 individuals, 181 kilograms of quinine in tabloid form being consumed. Among the persons treated there were 800 cases of malarial fever, giving a proportion of about 67 per mille. Considering the fact that, among the fever-stricken, 660 persons, already febrile from infection contracted in June or early in July, entered the seven zones where the work is being done from other sections, and that others did not follow out the treatment with regularity, an estimate is made that only 140 persons contracted malarial infection notwithstanding thorough prophylactic treatment with quinine. In all seven zones there were, during the five months, 448 cases of disease not of a malarial nature, gastro-intestinal catarrh predominating as in previous seasons.

A MEDICAL student at Lima accidentally inoculated himself, while assisting at an autopsy on a plague case, on 1st April, and developed the disease on 7th April, or after six days' incubation.

We direct attention to our London letter, in which Colonel Kenneth McLeod not only announces the passing of Netley, but also his own severance with this *Gazette*, to which he has been a contributor and Editor for the long space of 40 years. We are sure that our readers will join with us in regretting the loss of this valued contributor and will all wish him many more years of happy retirement.

Reviews

The Principles and Practice of Medical Jurisprudence.—By A. S. TAYLOR, F.R.S. Fifth Edition. Edited by FRED J. SMITH, M.D. 2 vols. London: Churchill & Co., 1905. 1,900 pages. Price 36s.

THESE two large volumes are the fifth edition of Taylor's great work on Medical Jurisprudence, which has long been the standard work on the subject in the English language. Two previous editions had been edited by Sir Thomas Stevenson, the last being in 1894. In the ten years that have passed since Sir Thomas Stevenson's edition such unparalleled activity has been shown in Medical Jurisprudence that the present Editor had a formidable task in bringing up this book to date, the more so as the very high position the book has always enjoyed as a work of reference and appeal, made it all the more necessary for a new edition to be equal to the reputation of the work.

After a careful examination of the book, we have no hesitation in saying that the new edition will keep up, and even enhance the reputation hitherto enjoyed by Taylor's Jurisprudence.

It is difficult to criticise a book of this size and importance, but for the information of our readers we may indicate the contents of each volume. The Introductory Chapter of 63 pages deals with the boundaries of Medical Jurisprudence and the duties of the medical jurist. We especially commend the sections on advice to medical witnesses and on medical experts. Section II deals with medico-legal responsibilities in the examination of the person, alive or dead. It is especially in cases of rape or indecent assault that the medical man has to be careful both in making his examination and in getting the consent of the accused. Many instances are here quoted of medical men getting into trouble because they neglected this point. The question of consent also arises over the making of an autopsy, and Dr F. Smith fully discusses this subject in all its aspects. The chapter on malpraxis is also most valuable, and two recent celebrated cases where foreign bodies were left in the abdominal cavity are detailed and commented upon. Section IV deals with identity, and gives an account not only of Bertillon's measurements, but also of thumb impressions. On the important question of blood stains full information is given, including an account of the physiological tests, as for the precipitin test. Dr Smith while noting that it is still on its trial says it seems to offer the very greatest of possibilities for the settlement of the all-important question, "Is this human blood?" It is quite impossible for us even to mention the thousand and one subjects referred to in the chapter on identity, it is most complete and thorough.

On the subject of adipocere the editorial in this *Gazette* on the subject (June 1902) is quoted *in extenso*.

The chapters or sections as they are called, on presumption of death, on wounds, on deaths from lightning and electricity, on starvation, on asphyxial deaths, on suicide, lunacy and life-assurance are all most complete and thorough expositions of the subject.

The second volume opens with a masterly discussion of 322 pages, on all questions of sexual medical jurisprudence, and following this are some 500 more pages on toxicology. It is hard to say which are the best parts of this work, but the thoroughness of the chapters on toxicology much impressed us. As a fitting summary to a foregoing discussion on poisoning in its medico-legal aspects is inserted an almost *verbatim* report on the recent case of *Rex v. Klosowski or Chapman* for the murder of Maud March. The marginal comments on the case are most instructive, and the case as here reported should be read by all medical men.

A new feature in this edition is a chapter on Indian Medical Jurisprudence by the Editor of this *Gazette*. It does not become us to say much about it, beyond indicating that this chapter contains a *resumé* of all the important medico-legal papers published in this Journal of recent years.

In conclusion, we have only been able to feebly indicate the vast amount of information in this work. We have not the slightest doubt that this new edition of Taylor's *Jurisprudence* will remain for many years the standard work of reference on the subject. An authoritative work of this kind should be supplied by Government to the office of every Magistrate and Civil Surgeon in India, and we commend these volumes to the notice of all civil surgeons and medical men in India. The work will be found reliable, authoritative, up-to-date and most interesting.

Diseases of the Intestines and Peritoneum

—By Prof. NOTHNAGEL. Published by W. B. Saunders & Co.

AMONG the many valuable contributions to medicine made by the Vienna School, the *Encyclopædia of Medicine* edited by Professor Nothnagel takes a prominent place, and among the monographs it contains the present from the pen of the editor himself, is worthy of the reputation of its author who has been eminently successful in giving what he aimed at a clear and comprehensive account of disease. The breadth of his knowledge of contemporary work and the amplitude of his personal experience have enabled Professor Nothnagel to produce a colossal monograph. We may, therefore, be pardoned a smile at the modesty which impels him to call it a clinical handbook. Handbooks such as this do not exist in the English language. Yet, large as must have been the original, the present translation has been made still more bulky by the valuable additions of the editor in his effort to bring the subject-matter up-to-date. The extent and character of these additions is by far the best criticism on the fine art of finality with which some of the subjects are disposed of in the original.

A large discretion was permitted the editor, and we are of opinion that he would have more thoroughly adapted the volume to the English and American reader had he not only added and interpolated, but also ejected and condensed portions of the original in which there is a vast deal of repetition and not a little verbosity. This would have added largely to the value of the book in the eyes of the practitioner for whom it was meant, but we find instead that in many instances the editorial additions overlap the original text and in some repeat themselves.

The work is in two parts, the first on the intestines, and the second on the peritoneum. Each of these opens with a brief account of the physiology of the subject, but in neither case is the physiology sufficiently up-to-date. Much has been done by the editor, but this portion of his task had far better been relegated to a specialist, who would, for example, have hardly failed to mention the important work of Bayliss and Starling on succus entericus, and on that substance in it to which they have given the provisional name of secretin. Nor would such

specialist have been content with the meagre account that is given of the physiology of the peritoneum.

To the practitioner, perhaps, the most valuable characteristic of this volume is the generous allotment of space to the consideration of symptoms, each one of which is dealt with in detail before the author attempts to treat of diseases. Even when individual diseases begin to be discussed, author and editor are both of them so liberal in their cross-references that not only is a vivid and comprehensive picture produced of each disease as it comes under consideration, but also its relations to others and its differentiation from them is pointedly brought out.

Where all parts of the book are excellent, it is perhaps invidious to call attention specially to the articles on enteritis, on ulceration, and on diseases of the blood vessels, both for their intrinsic value and their usefulness to the practitioner in India. A strong pathological bias runs through the book, and it is perhaps for this reason that in the article on enteritis the results of inflammation on the whole alimentary tract are more insisted on than of disease of specific parts. It is thus that colitis is but scantily touched upon by name and that only by the editor, but in the substance of the article one will find ample material for the differentiation and location of the inflammation. An etiological classification of ulcers is adopted, but here again by far the major portion of the article is devoted to the pathology of intestinal ulceration. Professor Nothnagel accepts Litten's explanation of the pathological anomaly that hæmorrhagic infarction should occur in the area of superior mesenteric artery which is not endarterial. Litten demonstrated that though not anatomically endarterial, the superior mesenteric is functionally an end artery since the blood-pressure produced by the influx from its anastomotic branches is counterbalanced by the positive pressure in the portal vein. But, as the editor points out, Welch of Baltimore, has since proved that the infarction is arterial and not venous since occlusion of the mesenteric artery causes tetanic contraction of the bowel, which lasts for two or three hours.

The article on hæmorrhoids affords us an excellent example of the plethora of information which leads the author into unnecessary side issues. The mere mention of Stahl's formulation of the mystical doctrine of hæmorrhoids results in the devotion of several paragraphs to "a few statements for general information," though he feels compelled to refrain from entering upon the interesting history of the doctrine of hæmorrhoids. All this was assuredly uncalled for. Just as much cause have we for surprise at the amount of space given to the discussion of nervous diseases of the bowels, following as it does upon a confession that the anatomical and clinical material on which it is

based is exceedingly limited. It is with pleasure that we pass on to the article on anomalies of position and form where the author is working on a solid basis of facts. Enteroptosis here receives the ample consideration that it deserves, but we are surprised to find that no mention is made of the probable casual relation in which visceral displacements stand to the loss of adipose tissue in the abdomen. The probability of the relation deserved some consideration.

An article on occlusion of the bowel from various causes concludes the first part of the volume. For fulness of detail, clearness of description and excellence of illustration, albeit somewhat diagrammatic from exaggeration in some cases, it will be hard to find the equal of this part of the volume in which the author shows himself as intimate with the work of English as of continental surgeons. Mayo Robson, Moynihan, Treves, Lockwood and D'Arcy Power have all been drawn upon. Mr. Power in particular has helped the editor to amplify and bring up-to-date the article on invagination of the bowel, which he made the subject of his Hunterian lectures.

In recent years there has been, thanks to the surgeons, such a swelling flood of information about the peritoneum and its diseases, that it is not to be wondered at if we are unable to find anything new or original in the second portion of the book. We would, however, draw attention to the editor's interpolation regarding the treatment of suppurative peritonitis with massive subcutaneous saline infusions. Though this has become the routine treatment at the London hospital, English practitioners still seem behind-hand in their recognition of its efficacy. In this well balanced and satisfying account of the diseases of the peritoneum, appendicitis is given a place on the ground that it is essentially a disease of the peritoneum. It is hardly worth traversing the author's argument, but we must confess ourselves opposed to his substitute for that much-abused hybrid word *Scalocoiditis* is a term which is unlikely to pass into general adoption. In this connection may we be permitted to express our surprise that so eminent a pathologist as Professor Nothnagel considers it necessary to speak of "idiopathic" peritonitis, "idiopathic" enteritis and even of "idiopathic" nerve pain. A frank confession of ignorance were better.

The translator of this volume can hardly be congratulated on the excellence of his work. The language of the entire volume has a distinct Germanic character which a more skilful workman would have readily removed. The construction of such a sentence as the following "This explanation, which I made not to fit all cases, but still covers a great number, has met with criticism". is not English, nor can we find any excuse for gross grammatical errors. Whom shall we accuse of printing spinal "column" when "cord" is meant? Who but a rigid etymologist

would let pass the expression, "hæmatæmesis from the lower bowel," meaning *melæna*?

The publishers have done their best to bring out this important work in suitable form. Print and paper are good, but weary aims make us hope that in a future edition the desirability of a two-volume issue may be considered.

The editing of this volume, the work of so eminent a teacher, has evidently been a labour of love to Dr. Rolleston, whose personal contributions have greatly advanced its value, and to him are due the hearty thanks of that large section of the profession in England and America who are not familiar with German.

Current Literature.

(PUBLIC HEALTH)

The Purification of Water by Copper—We have already indicated our belief in the value of copper as a means of purification of water, and as this method has been taken up by many municipalities in India, we herewith quote *in extenso* a valuable article which have appeared in the May number of the *American Journal of the Medical Sciences* (pp 754, etc). We hope to see the experiments repeated in India. It is clear that if these experiments are conclusive, it behoves us to go in for storage of water in copper vessels, rather than enamelled iron, or even aluminium.

Studies on the Bactericidal Action of Copper on Organisms in Water by Nathaniel Gildersleeve, M.D., First Assistant in Bacteriology Laboratory of Hygiene, University of Pennsylvania, A. C. Abbott, M.D., Director. The investigations of Moore and Kellerman* on the employment of copper for the destruction of algae, and incidentally of bacteria, in water, have developed an excellent method for the destruction of certain algae which have caused a great deal of annoyance, the presence of these cryptogams in water frequently causing a disagreeable odour and taste rendering it unfit for household, and, in many instances, industrial purposes. Such waters while they are not, in the present state of our knowledge on the subject, looked upon as being especially detrimental to the health of a community, will be condemned, and justly, on account of their disagreeable odour and taste. The same community, however, will use bacteriologically impure water, a much more dangerous water, without considering the question of impurity. The latter, being in many cases clear, odourless, and tasteless, does not appeal to the senses as do those containing algae, and in spite of all that has been said and done, it is exceedingly difficult to prevail upon many of the populace to take measures which will remove a contamination that is not manifest, i.e., cannot be detected by appearances, and therefore to them does not exist. Should these waters become turbid or show other evidences of pollution, they are ready for any measure that will remove the objectionable features. Manifestly, the work of the above mentioned investigators has been of great value from both a sanitary and æsthetic standpoint. Furthermore, it has caused a great deal of discussion and controversy over one of the more vital questions confronting the sanitarian—namely, that of the destruction of bacteria in contaminated waters. They have shown conclusively, both

* Bulletin, No. 84, Bureau of Plant Industry

by laboratory experiments and the practical application of the method, that the repeated treatment of small bodies of water (lakes, ponds, reservoirs, etc.), at comparatively long intervals with small amounts of cupric sulphate will keep them free from objectionable algae. When we approach the question of destroying bacteria in water by such methods certain factors must be taken into consideration, viz., the contamination usually being continuous, or at frequent and irregular periods, the bactericidal substance must be used continuously, and, for various reasons, in as small quantities as possible, therefore the question must be considered from the following standpoints:

- (1) Are bacteria destroyed by very dilute solutions of copper salts or by copper in any form,
- (2) Which of the copper salts is the most active, and at the same time cheap enough to prevent the question of expense being so great a factor as to exclude its use?
- (3) What influence would organic and inorganic substances, from various sources, have on the action of the copper,
- (4) Would the constant ingestion of small quantities of copper have a detrimental effect on the health of an individual using water so treated?

While the latter question will not be discussed in this paper we wish to state, for the benefit of the laity and many of the profession who entertain erroneous ideas regarding the subject, that it is not the object of sanitarians, who advocate the use of copper for the purification of water, to use it to the exclusion of other approved methods, such, for instance, as filtration, but to employ it to supplement such methods when the filters are for any reason inadequate, when they are in process of construction, or when filters cannot be immediately installed. And we sincerely hope that work along this line will not convey the idea to anyone that filtration is unnecessary. Also, that the writer who, when the question was first taken up, was strongly prejudiced against the employment of copper for this purpose has been unable to find any authentic records of chronic poisoning.

The investigation reported in this communication was undertaken to determine to what extent various bacteria are destroyed by dilute solutions of copper salts, and also to show which of these salts has the greatest bactericidal action. Incidentally a few experiments were made with colloidal copper.

The experiments include the action of these substances on *B. typhosus*, *B. coli communis*, *B. dysenteriae*, *B. cloacae*, *B. proteus vulgaris*, *B. prodigiosus*, and the *staphylococcus pyogenes aureus*.

These organisms were selected for the following reasons. Some are pathogenic bacteria causing diseases which frequently follow the use of contaminated waters, and are those which we especially desire to destroy, others while non-pathogenic are frequently, one might say constantly, found in such waters, and the various organisms, possessing different degrees of resistance to the action of bactericidal substances, give us a fair indication of the action of the substances on the majority of non-spore forming bacteria.

METHODS OF PROCEDURE—Flasks containing the various solutions were inoculated with either a small amount of a twenty-four hour bouillon culture, or a large loopful of bacteria scraped from the surface of a twenty-four hour agar culture, the organisms were thoroughly distributed throughout the solution and agar plates made immediately, to serve as controls, and one half and one hour after inoculation, then at intervals of one hour for twelve hours, and if all bacteria were not destroyed within the twelve-hour limit, again at twenty-four hours. The plates were examined at the end of twenty-four hours, and, taking into consideration the facts that some of the organisms employed developed more slowly than others, and that while some might not be destroyed, yet their functions

would be so inhibited that they would develop slowly, they were counted at the end of forty-eight and again at seventy-two hours, which we consider would be ample time for the development of all bacteria. At least five experiments were made with each organism in the various solutions and dilutions.

EXPERIMENTS ON THE ACTION OF CUPRIC SALTS—In these experiments the sulphate, chloride, acetate and nitrate were employed in solutions of 1 250,000, 1 500,000, 1 1,000,000, 1 1,500,000, 1 2,000,000, made with both distilled and tap water.

Experiments show the bactericidal properties of the sulphate to be greater than that of the other salts, a solution of 1 250,000, as a rule, destroying the *bacillus typhosus* and *bacillus coli communis* in less than one hour, in solutions of 1 500,000 and 1 1,000,000 they were usually destroyed in two to three hours, while in solutions of 1 2,000,000 there was rarely more than 80 to 90 per cent destroyed in ten hours, and frequently a few would be capable of developing after twenty-four hours' exposure. Some strains of *B. coli communis* appear to be slightly more resistant than *B. typhosus*. The resistance of *B. dysenteriae*, *B. cloacae*, *B. proteus vulgaris*, and *staphylococcus aureus* is greater than that of the *B. typhosus* and *B. coli communis*. A solution of 1 250,000 would not destroy the *B. prodigiosus* in less than five to six hours, and a 1 500,000 solution would frequently require ten hours for the destruction of this organism. If, however, the bacteria were washed in distilled water before inoculation of the flasks, the resistance was found to have been lessened, due in all probability to the fact that some of the slimy substance which surrounds the bacterial cell and protects it, to some extent, from the action of detrimental agencies, is removed.

The other cupric salts were found to be less active than the sulphate in the following order: chloride, acetate, nitrate.

The following table will serve to show the difference in the action of the various salts on the *B. typhosus* and *B. coli communis*, and of the cupric sulphate on the various bacteria.

COLLOIDAL SOLUTIONS—These experiments were made in both distilled and tap-water as follows:

(1) Inoculation of 100 c.c. flasks of water containing pieces of copper foil of various sizes.

(2) Inoculation of copper vessels of 500 c.c. capacities.

In the first series of experiments pieces of polished copper foil giving an exposed surface of from 0.5 to 3 c.c. were placed in an Erlenmeyer flask containing 100 c.c. of water. Some were inoculated immediately, others containing pieces exposing a surface of 0.5 cm. were placed aside and allowed to stand for ten days before inoculation. In those inoculated immediately after the copper had been placed in the flask, there was always a reduction in the number of bacteria, but in no instance over 50 per cent in eight hours, while those in which the foil remained for ten days before inoculation gave results as follows:

Bacillus typhosus, 90 per cent destroyed in two hours, 98 per cent in three hours, and all in four hours; *bacillus coli*, 50 per cent destroyed in two hours, 85 per cent in three hours, 90 per cent in four hours, and all in five hours; *bacillus dysenteriae*, 83 per cent destroyed in two hours, 98 per cent in three hours, in four hours but twenty-five bacteria developed, and all were destroyed in five hours; *bacillus cloacae*, 20 per cent were destroyed in two hours, all were not killed until they had been exposed to the action of the solution for ten hours; *bacillus proteus vulgaris*, 97 per cent destroyed in twenty-four hours; *staphylococcus pyogenes aureus*, 68 per cent in two hours, at the end of four hours twenty-five colonies developed, in five hours all had been destroyed. The *bacillus prodigiosus* was more resistant, being decreased but 50 per cent in twenty-four hours.

TABLE SHOWING ACTION OF THE VARIOUS CUPRIC SALTS ON THE B TYPHOSUS AND B COLI COMMUNIS

Organism	Salt	Dilution	Average number to c c in control	Per cent. destroyed in hours													
				1	2	3	4	5	6	7	8	9	10	11	12	24	
B typhosus	Sulphate	1 250,000	110,000														
		1 500,000	100,000	99	100												
		1 1,000,000	140,000	78													
		1 1,500,000	120,000	50	85	99	100										
		1 2,000,000	130,000	4	7	55	80	82	87	87	93	93	100				
	Chloride	1 250,000	100,000	99	100												
		1 500,000	92,000	98	100												
		1 1,000,000	95,000	10	20	32	50	62	75	83	92	92	93	94	94	98	
		1 1,500,000	103,000	8	14	20	23	40	59	62	64	64	65	65	66	85	
		1 2,000,000	114,000	5	10	14	16	21	29	33	34	34	34	35	35	42	
	Acetate	1 250,000	122,000	80	95	99	100										
		1 500,000	113,000	66	66	68	70	73	80	89	94	96	100				
		1 1,000,000	117,500	7	19	22	30	33	42	42	45	46	46	48	62	95	
		1 1,500,000	121,000	5	10	19	25	28	35	36	40	41	55	49	50	75	
		1 2,000,000	108,000	2	2	4	9	11	15	22	30	33	33	34	34	65	
Nitrate	1 250,000	85,000	21	33	40	50	58	71	80	90	93	95	99	100			
	1 500,000	82,000	11	20	38	61	60	70	78	84	84	85	85	87	99		
	1 1,000,000	91,000	5	10	10	10	11	12	30	32	33	35	37	42	90		
	1 1,500,000	98,000	0	3	9	12	14	18	20	20	23	26	37	29	80		
	1 2,000,000	79,000	0	0	5	8	12	13	22	22	22	24	25	25	71		
B coli communis	Sulphate	1 250,000	105,000	100													
		1 500,000	120,000	99	100												
		1 1,000,000	99,000	80	99	100											
		1 1,500,000	150,000	87	95	99	100										
		1 2,000,000	110,000	8	10	14	27	50	85	90	92	93	93	95	98		
	Chloride	1 250,000	160,000	89	99	100											
		1 500,000	140,000	58	68	95	97	99	99	99+	100						
		1 1,000,000	100,000	20	24	31	38	50	54	65	65	66	67	75	80	98	
		1 1,500,000	124,000	10	10	13	15	21	29	32	34	35	38	44	55	89	
		1 2,000,000	120,000	2	5	7	13	17	19	23	23	26	29	33	35	73	
	Acetate	1 250,000	120,000	78	95	99	100										
		1 500,000	130,000	22	38	54	77	81	87	89	96	98	99	99	100		
		1 1,000,000	136,000	5	8	11	15	22	36	38	48	57	52	55	62	90	
		1 1,500,000	120,000	3	10	10	11	13	16	22	37					76	
		1 2,000,000	124,000	0	2	6	8	9	11	11	15	18	23	26	28	68	
Nitrate	1 250,000	100,000	13	22	30	30	35	45	51	60	71	75	85	94	100		
	1 500,000	100,000	5	10	12	20	20	25	30	35	41	49	58	72	99		
	1 1,000,000	104,000	7	10	10	11	12	15	20	30	32	40	61	60	90		
	1 1,500,000	90,000	0	2	5	7	8	11	15	25	31	31	34	88	68		
	1 2,000,000	92,000	0	0	3	5	5	7	9	12	15	19	25	30	61		

When copper vessels of 500 c c capacity, which gave a surface of 268 square centimetres exposed to the water were employed, the action was more marked, the B typhosus and B coli communis being, as a rule, completely destroyed within three hours. The B dysenteriae, B cloacae, and staphylococcus aureus and B proteus vulgaris are more resistant. The B prodigiosus always showed a marked reduction in numbers, but was rarely completely destroyed in twenty four hours. It is interesting to note that two cultures of B prodigiosus from different sources employed, while being but slightly decreased in numbers in two to three hours, had almost complete inhibition of their pigment producing function, after exposure to the copper for this period, regaining it, however, after cultivation for two or three generations on suitable media. The copper must be kept highly polished, as after it has become tarnished, the bactericidal action is markedly inhibited.

Flasks containing one litre of a 1 500,000 solution of cupric sulphate were inoculated with relatively large quantities of bacteria, plated and re inoculated at intervals of from two to six hours.

The results show that after a series of inoculations, the bactericidal action of the solution gradually decreases.

The action was greater when distilled water was used for making the dilution than when tap-water was employed. Very little difference was found between

the distilled and the filtered water used in the laboratory. The bacteria from agar cultures were more readily destroyed than those in bouillon cultures, this might be explained by the fact that a small amount of bouillon, 0.05 to 0.1 c c was added to the solution with the bacteria.

The question arises. Why is the bactericidal action of the sulphate greater than that of the other copper salts? Many of the metallic salts precipitate albuminous substances, eg, those of mercury and copper, in fact, salts of most of the heavy metals. These by coagulating the protoplasm will kill the organism. In the precipitation there is formed a compound of the metal with the albumin. One would naturally consider that the compound containing the highest percentage of the metallic element would possess the greatest bactericidal activity. Such, however is not the case, and we are compelled to look farther for an explanation. Kröning and Paul,* in an investigation on the action of various chemicals on bacteria, showed that certain compounds varied, in their action, in proportion to the degree of electrolytic dissociation. Copper sulphate undergoes dissociation into its positive and negative ions more readily than the other cupric salts. The copper ion combines with certain constituents of the

* Zeitschrift f Hygiene, 1897, Bd XXV

TABLE SHOWING THE ACTION OF CUPRIC SULPHATE ON VARIOUS BACTERIA

Organism	Dilution	Average No per cc in control	Per cent. destroyed in hours													
			1	2	3	4	5	6	7	8	9	10	11	12	24	
B typhosus	1 250,000	110,000	100													
	1 500,000	100,000	99	100												
	1 1,000,000	140,000	78	100												
	1 1,500,000	120,000	50	85	99	100										
	1 2,000,000	130,000	4	7	55	80	82	87	87	93	98	100				
B coli com munis	1 250,000	105,000	100													
	1 500,000	120,000	99	100												
	1 1,000,000	99,000	80	99	100											
	1 1,500,000	150,000	87	95	99	100										
	1 2,000,000	110,000	8	10	14	27	50	85	90	92	93	93	95	98	100	
B dysenteriae	1 250,000	11,500	95	100												
	1 500,000	120,000	40	95	97	100										
	1 1,000,000	72,000	31	50	82	85	99	99 +	100							
	1 1,500,000	12,400	20	30	40	42	60	70	75	81	85	87	90	91	100	
	1 2,000,000	13,600	20	20	25	30	30	45	60	62	62	68	71	75	98	
B cloacae	1 250,000	92,000	90	99	100											
	1 500,000	86,000	68	90	99	100										
	1 1,000,000	101,000	33	85	89	96	96	99	100							
	1 1,500,000	89,000	5	10	30	40	70	85	95	98	98	99	100			
	1 2,000,000	94,500	3	10	31	40	80	83	85	88	91	91	93	97	100	
B proteus vulgaris	1 250,000	115,000	93	100												
	1 500,000	106,000	65	92	98	100										
	1 1,000,000	111,000	28	51	82	90	95	98	100							
	1 1,500,000	99,000	10	18	27	42	69	90	93	98	99 +	100				
	1 2,000,000	118,000	0	12	22	36	51	65	78	80	85	88	92	95	100	
B prodigiosus	1 250,000	102,000	95	99	99	99 +	100									
	1 500,000	109,000	15	28	80	95	97	99	99 +	100						
	1 1,000,000	110,000	9	11	16	33	33	45	47	61	63	69			93	
	1 1,500,000	107,000	4	12	17	30	38	46	46	48	51	52	60	61	92	
	1 2,000,000	98,000	0	1	8	8	10	11	15	30	33	41	43	50	88	
Staphylococcus pyogenes aureus	1 250,000	92,000	99	100												
	1 500,000	88,000	50	70	90	100										
	1 1,000,000	86,000	15	30	30	70	78	85	97	99	99	100				
	1 1,500,000	100,000	8	22	28	98	58	69	85	93	95	99	100			
	1 2,000,000	95,000	1	8	10	30	50	64	79	82	85	98	99	99 +	100	

bacterial cell, either destroying it directly or rendering the cell wall impermeable, so that nutritive substances cannot be absorbed. Colloidal copper in all probability acts in the same manner.

The results obtained seem to warrant the following conclusions:

(1) Dilute solutions of copper salts have a marked destructive action on many bacteria. Of these salts the sulphate is most active. This is probably due to the fact that it undergoes electrolytic dissociation more readily than the others.

(2) The amount of sulphate to be used in the water should be from one part in 250,000 to one part in 100,000, depending on the character of the water.

(3) Colloidal copper will quickly destroy certain bacteria, should copper vessels or plates be used to destroy bacteria in water they must be kept highly polished, or the bactericidal properties will be greatly reduced.

(4) We have been unable to find evidence of copper, ingested in small quantities for long periods, having a detrimental action on the health of an individual.

parasites cannot be found, may really be cases of spirillum fever. In this connection it may be of interest to note, as an instance of the wide distribution of the disease, that two cases occurred in transport drivers of the Tibet Force, men who had spent many months in the Chumbi Valley. The spirilla were first seen in the course of a routine examination for malaria parasites on the day the patients were admitted to hospital. But the clinical course in both cases was so typical that the microscope was hardly needed to settle the diagnosis. Their only point of difference was that one man had a very large soft spleen, while that of the other was not only much enlarged, but also indurated. The former's blood showed simple polynuclear leucocytosis, the latter's contained a high proportion of large mononuclears, suggesting old malaria.

The spirillum has certainly rather a feeble affinity for stains, and shows up better with carbol fuchsin than with Leishman, but specimens stained with the latter stain, sufficiently deeply to show malaria, will show spirilla if present. Objects so striking could hardly escape notice even if somewhat faintly coloured. The clinical picture, too, of spirillum fever is a very definite one, and has little resemblance to that of malaria.

It is difficult, then, to believe that spirillosis can account for any very large proportion of the unexplained fevers of India. It is true that in many stations one may examine case after case of fever without finding malaria parasites. One used to put down such failures to defective technique, but subsequent work in a really malarious place (the Teesta Valley) where the same technique and stains showed parasites in nearly every febrile case, convinced one that there were other reasons. In my limited experience many of the continued cases of non malarial fever in natives have been proved by Widal's test to be typhoid, or by the microscope to be tubercular. As to those cases which recover after two or three days, without other treatment than rest in hospital, may they not be caused by simple exposure to intense heat or severe cold? It is not necessary to suppose that bacterial and other toxins are the only things that can throw the heat-regulating mechanism out of gear.

Correspondence

SPIRILLUM FEVER IN INDIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In the June number of the *Indian Medical Gazette* Major Wimberley suggests that some of the numerous febrile cases occurring in the Peshawar Valley, in which malaria

Spirilla, morphologically similar to those of relapsing fever, are found in many conditions. One has seen them in several cases of pyorrhoea alveolaris, but probably there is no causal connection, for they are often seen while examining the sputa of patients with ill-tended but healthy mouths. They also infest the mouths of dogs.

James has noted their presence in the scrapings from ulcers in dogs. Vincent has described a special form of sore throat associated with spirilla and bacilli fusiformes, and Metschnikoff, before the Paris Academy of Medicine, has accused a certain Spirochaete Pallida of causing syphilis.

The relationship between these various spirilla, so similar in appearance, so unlike in their mode of life, would form a most interesting subject of research.

Yours, &c.,

W B TURNBULL, CAPT, I M S

GONDA

SPIRILLUM FEVER IN INDIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—I have read with interest Major Wimberley's letter in your June issue regarding the prevalence of spirillum fever in the Peshawar Valley. While officiating as Civil Surgeon here, I have met with a severe and extensive epidemic of the disease, and the facts of the case may be of some interest.

Information was received that a large number of cases of fever were occurring in the Eastern portion of the Mardan District, and that this fever was attended by a considerable mortality. I first sent out my Assistant Surgeon, and then visited the place myself.

Prevalence—At present there are about 400 cases confined to seven villages near the right bank of the Indus.

Mortality—This was difficult to arrive at but could not have been less than 10 per cent.

Sex and age—Chiefly males between 25 and 30. Only one case seen in a child and two in women.

Symptoms—These were fairly typical as described in the books on the subject, but there were several interesting points which were not those usually described. They were

I. **Epistaxis**—This generally occurred on the second or third day and was very severe, lasting for about 24 hours. The people stated that the epistaxis cases had a better chance of recovery than the others. I cannot vouch for this fact.

II. **Dysenteric symptoms**—These generally appeared on the 5th day, and here again the amount of blood lost was considerable. In some cases the motions consisted almost entirely of pure blood. Most of the fatal cases seem to have had dysenteric symptoms.

III. **Relapses**—Nearly all the convalescent cases had had either one or two relapses. This was the commonest state of affairs, but one had suffered four relapses as well as the original attack and although very weak, was recovering. The average period of fevers, both primary and relapse, was seven days, and of the interval, in all to four days.

The Blood—This was examined with some difficulty as I had no slides with me, and had to use pieces of a window pane. However, the spirilla were found in 45 per cent of cases. In some they were in enormous numbers as many as fifteen in every field, and in others could only be got with difficulty. I believe with proper apparatus the spirilla could be found in every case, if the blood is taken in the febrile stage.

Yours, &c.,

E A WALKER, M B,

Lieut, I M S

QUININE IN PREGNANCY

To the Editor of "INDIAN MEDICAL GAZETTE"

SIR,—I should be glad to have the opinion of some of the Senior Civil Surgeons of the service as to the advisability of giving quinine to pregnant women suffering from malaria.

I have on several occasions had such cases under my care, and have given them quinine with most satisfactory results, yet it was not without a certain amount of fear as to the possibility of premature labour being induced thereby.

It is a very common belief—among the laity at least—that quinine should not be given during pregnancy.

I should like to bear through the columns of the *Gazette* what other civil surgeons of more experience than myself have to say on the subject.

I am, &c.,

CIVIL SURGEON

[We invite discussion.—ED, I M G.]

IS CATARACT COUCHING EVER JUSTIFIABLE?

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—That almost diametrically opposite opinions as to the results of "couching" in India should be held by Majors Maynard and Smith is striking. The question at issue is an important one and we need accuracy. The former officer in a carefully worked out paper gives 46 per cent of good vision after an interval of five years, the latter does not quote figures but states that the vast majority of couched eyes go wrong either at once, or soon after. It would be more satisfactory to quote figures. Couching is not carried on to a large extent in Burma, during the last two years I have seen only ten cases. Of these two have good vision. One is under my care now. He has come for treatment of cataract in his other eye. He is a Burman, aged 68. His left eye was couched, he says six years ago by a kala (Native of India) v = 3 with a + 10. Vision is normal. The other case had been couched some years before I saw him and had good vision. Thus, two out of ten retained good vision for over five years. That the ordinary Indian cataract picker, who is ignorant of anatomy and the laws of asepsis, can obtain so many good results is astonishing, and one is led to think that the failures are due rather to unskilful operating than to the operation itself. Undoubtedly in the hands of skilled surgeons much better results could be obtained. One sees in Burma a number of patients suffering from cataract unfortunately complicated with severe granular conjunctivitis which needs prolonged treatment before one dare operate. This waiting is too much for the impatient Burman, and in many instances, before the eye is in a condition for operation, he loses faith, thinks his case hopeless and is lost sight of. In such cases the temptation to resort to "pricking" is strong. In such cases, therefore, in chronic conjunctivitis which will not yield to treatment, and in the presence of dacryo cystitis I fully agree with Mr Henry Power and Major Maynard in the conclusion that, under certain circumstances, it would be allowable, if not advisable, to revive the ancient method of depression for the restoration of light in cases of cataract.

Yours, &c.,

W G PRIDMORE

MOULMEIN, BURMA

A MICROBE FROM THE JUMNA RIVER AT AGRA AGGLUTINATING WITH ANTI TYPHOID (THERAPEUTIC) SERUM

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—This microbe was selected while examining the Jumna River water for typhoid by Prof. Hankin's method. The following is the description of this organism—

Source—From the Jumna River at the intake of Agra water works. **Morphology**—From agar cultures, twenty four hours' incubation at 37°C. Short bacilli in pairs at times, also seen in filaments or threads. Broth cultures twenty four hours—Short bacilli with rounded ends, no threads seen. **Size**—About half the length of typhoid bacilli but rather thicker, stain readily with ordinary aniline dyes and uniformly throughout. Do not retain the stain by Gram's method. **Motility**—Active, often rotatory and darting, grow freely on all ordinary culture media at 37°C.

On agar agar (slant cultures)—Growth along streak with a thick colony spreading from it. Individual colonies round and raised centrally, with undulating margins. Transmitted light gives to colony a bluish appearance. Golden colour in the middle with fleecy appearance at the margins by reflected light, similar appearance on all media. In broth—Medium cloudy in eighteen hours at 37°C, neither sediment nor scum, no change in the colour of the medium and no smell produced. On blue litmus glucose agar—Medium in twenty hours was reddened throughout, with production of gas, and nearly decolorised after 72 hours. **Milk**—Coagulated in 36 hours, curds soft and in fragments, whey formed in small quantity. **Potato**—No growth visible after twenty four hours at 37°C, but in forty eight hours growth occurs, shiny, creamy, dirty brownish. The film is thick and watery. **Indol**—Not produced.

Agglutinative reactions—Stock anti typhoid serum of Burroughs and Wellcome used. It agglutinated stock cultures of typhoid and colon bacillus in hanging drop in dilutions up to 1 in 1,500, and 1 in 80 respectively. With this serum, agglutinative action was obtained in the case of the microbe in question in dilutions up to 1 in 600.

From the above description it is evident that this bacillus has characters intermediate between those of *B. Coli* Communis and *B. Typhosus*. Such have been isolated from waters and described by European and American observers, but it seems profitable to record the occurrence in an Indian river.

water My thanks are due to Captain Windsor, I M S, for hints with regard to the above described investigation

S N GORE, L M & S (BO UNIV)

Additional Chemical Examiner, U P A & O

AGRA

CASE OF MALIGNANT TERTIAN SIMULATING PLAGUE

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—A patient, named Kunnyakku, aged 17, Malayalee, was admitted into this hospital on 10th April 1905, with fever of 103°, severe head ache, pain in all the joints, eyes red, and somewhat blood shot, tongue coated with brown fur, speech hurried, did not answer questions put to him freely. He was dull and delirious.

On examination, the organs were healthy. Bowels constipated, appetite impaired, sleep disturbed.

11th April 1905.—His blood was examined and malignant tertian parasites were found. These were of the signet ring forms, and in many fields three to four rings were included in a corpuscle, and in each field six to seven affected corpuscles were seen. In fact, it may be said that this was one of the heaviest of infections that we have come across here. On the 12th and the 13th April, the parasites had grown larger.

Since the finding of the parasites, he was put under quinine both hypodermically and by mouth.

Development of Symptoms

On the morning of the 15th April, he complained of pain in the right ear, and in the evening the pain became severe, extended behind the ear where a slight swelling was also noticed, when he was transferred to Plague Hospital. On the 16th I tried his blood for plague bacilli by Dr Ross's method and found none, crescents were present.

On the 18th April, the pain and swelling completely disappeared, and the patient ultimately recovered.

Remarks—From the type of fever being continuous, from the blood shot eyes, the subsequent swelling behind the ear, plague was suspected, notwithstanding that all the time the blood was teeming with malignant parasites. I contribute this case to show how closely malaria manifestations may simulate those of plague.

Yours, &c,

P S RAMACHANDER,

1st Cl Hospital Asst, Victoria Hospital, Bangalore

NYCTALOPIA IN INDIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR—Though it is a rare disease in Europe, nyctalopia is not so uncommon in the tropics.

There are two varieties of night-blindness—one symptomatic and the other idiopathic. The etiology of the disease is very obscure, and much more varied and uncertain is its treatment too. Dr Tweedy says that "the prognosis of the symptomatic night-blindness is generally unfavourable, while that of the idiopathic is more favourable—at least in so far as associated, constitutional and local states may be amenable to treatment."

Recently we had to deal with several cases of night-blindness, but I am not sure whether those were idiopathic or symptomatic.

Dr J N Ghosh, recently Civil Surgeon of Dinajpur, suggested to put Tr Capsai and water in equal parts into the eye once or twice a day.

We noticed a marvellous result in all our cases, which took a favourable turn within a week, and some of them were apparently cured.

Though I am not certain about the permanency of the result, I hope some abler hand will not fail to give a fair trial to it and take up the matter for the benefit of the profession.

Yours, &c,

HARI CHARAN GUPTA,

Medical Officer, Sadar Hospital, Dinajpur

Service Notes.

THE following officers of the Madras Medical Service in civil employ are on leave, and due back on the dates given—

Major R Robertson on 7th November 1905

Major P C Gabbett on 14th November 1905

Captain T H Foulkes, I M S, on 3rd October 1905

Captain E Millington, I M S, on 9th July 1905

Captain T E Watson, I M S, on 11th November 1905
Captain C G Wohstol, I M S, on 22nd October 1905
Captain J W Cornwall, I M S, on 30th October 1905
Captain W G Richards, I M S, on 20th October 1905
Captain R Bryson, I M S, on 30th November 1905

MAJOR J PENNY, I M S, Junior Civil Surgeon, Rangoon, was placed on special duty in connection with plague, in addition to own duties from 11th February to 3rd March 1905

SHEIK ABDUL RAHMAN, L R O P & S (Edin), is appointed to the civil medical charge of Pyapon District, Burma, and Assistant Surgeon N P Niyogi is appointed to Mergui District as a temporary charge, pending the arrival of Mr L G Fink, M B, C M

LIEUTENANT W S PATTON, I M S, is appointed to the officiating medical charge of 123rd Outram's Rifles

HONORARY CAPTAIN J E HIPPOLETTE, I S M D, is granted eight months' and six days' leave in India

CAPTAIN E J O'MEARA, I M S, was granted six weeks' privilege leave from 29th May 1905

LIEUTENANT L J O'REILLY, I S M D, was granted six weeks' privilege leave from 2nd June 1905

LIEUTENANT F E WILSON, I M S, took over the civil medical duties of Deira Ismail Khan District from Major H F Whitechurch, V O, I M S, on 30th April 1905

FIRST CLASS ASST SURGEONS T W MINTY, A. Cartman, O Raymond, and L X. DeSilva, I S M D, have been granted silver medals for long service and good conduct

CAPTAIN A MOORHEAD, I M S, took charge of the civil medical duties of Deira Ismail Khan District on 11th May 1905, relieving Captain W H Leonard, I M S

COLONEL J P GREANY, M D, I M S, has been appointed to succeed Surgeon General McConaghy as Surgeon General with the Government of Bombay

Surgeon General W McConaghy entered the service in October 1869 at the age of 24 years, he received Brigade Surgeon's rank in October 1896, and but recently succeeded Surgeon General G Bainbridge

Surgeon General Greany was born in July 1851, entered the service on 31st March 1875, he has therefore become Surgeon General in 30 years' service. He belongs to the same batch as Colonel Ranking, Colonel R D Murray, the late Lieutenant Colonel D W D Comins, Colonel R Macrae, Colonel T E L Bate, C I E, in Bengal, and Lieutenant-Colonel G T Thomas and the late Lieutenant-Colonel A Adams in Madras

THE following officers, I S M Department have been placed on plague duty in Burma—

Military Assistant-Surgeons J Fraser, P E O'Donoghue, T H. Brooks, M O Pinto, P N Sandways, H C Perenna, W R Bennet and O G Taylor

THE Tibet Medal has been sanctioned by the King to all members of the Mission and accompanying force who served at or beyond Silguri between 30th December 1903 and 23rd September 1904. There will be a clasp inscribed "Gyantse" for all those present at the operations at and around Gyantse between 5th May and 6th July 1905

The ribbon will be red with green borders and two white stripes

THE following changes have taken place in Madras—

Major D Simpson, M D, I M S, has succeeded Lieutenant-Colonel A J Sturmer, I M S, as Superintendent of the Government Maternity Hospital. Major F J Crawford, I M S, has been appointed 2nd Surgeon to the General Hospital, with the port and marine duties. Major C Donovan, I M S, has been appointed Surgeon to the Third District, Madras, and 2nd Physician to the General Hospital. Major E H Wright, I M S, is to act as Surgeon to the Fourth District, *vice* Lieutenant-Colonel Browning, I M S, Officiating Principal

CAPTAIN D C KEMP, I M S, is appointed District Medical Officer at Cuddapah, but remains for the present in charge of North Arcot

CAPTAIN R W KNOX, I M S, is confirmed as an Agency Surgeon, 2nd Class, from 12th September 1904
 Major T W Irvine, I M S, from 9th November 1904
 Captain de V Condon, I M S, from 5th December 1904
 Captain W Lethbridge, I M S, from 5th December 1904
 Captain P P Kilkelly, I M S, from 9th December 1904

MAJOR C H L. PALK, I M S, is appointed Medical Officer, Nilgiri Volunteer Rifles, from 18th April 1905

ON the death of Lieutenant-Colonel Nariman, I M S, Captain J L Majoribanks, I M S, held temporarily the charge of the Civil Surgeoncy of Nasik

DURING the absence on short leave of Surgeon General McConaghy, Bombay, Lieutenant-Colonel W G H Henderson, I M S, F R C S I, acted temporarily as Surgeon General to the Government of Bombay

ON return from furlough Captain P F Chapman, I M S, is appointed Civil Surgeon of Amraoti, C P

DR. T W QUINN is transferred as Civil Surgeon from Damoh to Betul, C P

CAPTAIN P K CHITALE, I M S, is appointed Civil Surgeon of Damoh

LIEUTENANT R F O TALBOT, M D, F R C S I, I M S, was employed on plague duty in Burma from 15th February till 15th March 1905

THE services of Captain P K Chitale, I M S, and of Captain W H Kenrick, I M S, have been permanently placed at the disposal of the Government of the Central Provinces

LIEUTENANT W C ROSS, I M S, joins civil employment temporarily in Bengal

CAPTAIN H M MACKENZIE, I M S, is posted as Civil Surgeon of Wana

CAPTAIN W M ANDERSON, I M S, is posted as Civil Surgeon of Kurnam

CAPTAIN J W WATSON, I M S, holds charge of the duties of His Britannic Majesty's Consulate at Tenbar-i Haidari during the absence on leave of Captain C B Winter

LIEUTENANT J H GILL, M B, I M S, is transferred to the temporary half pay list from 27th March 1905

MAJOR W B LANE, I M S, on return from leave was appointed Inspector General of Prisons, Central Provinces

MAJOR J T LLOYD JONES, I M S, Deputy Assay Master, Calcutta was granted seven months' combined leave from 18th April 1905

COLONEL R. D. MURRAY, I M S, is promoted Colonel, *vice* Colonel C H Joubert, I M S, retired, and his tenure of appointment dates from 29th March 1905

LIEUTENANT T C MCC YOUNG, I M S, took over the civil medical duties of Bannu District on 10th April, relieving Captain J Husband, I M S

LIEUTENANT COLONEL J FRENCH MULLEN, I M S, is promoted to be Civil Surgeon, 1st Class, *vice* Colonel R. Macrae, I M S

THE Civil Surgeons, 1st Class, in Bengal, on 1st April as shown in Civil List, are Lieutenant Colonel Cobb, on leave, Lieutenant-Colonel J B Gibbons, I M S, at Howrah, Lieutenant-Colonel R Neil Campbell, I M S, at Dacca, Lieutenant-Colonel D G Crawford, I M S, at Hughli, and Lieutenant Colonel R H Whitwell, I M S, at Bankipore

LIEUTENANT COLONEL F C REEVES, I M S, was due back from leave on 8th June 1905

LIEUTENANT COLONEL J C MARSHEN, I M S, is due back on 3rd October 1905

MAJOR F J CRAWFORD, I M S, got one month's privilege leave from 15th April to 14th May 1905

MR E H H. HANKIN, Chemical Examiner, U P and A, has been granted an extension of leave up to 1st August 1905

RULES have been published (Military Department No 1363B, dated 22nd March 1905) for an examination in the Somali language The reward admissible is Rs 180

THE following letter appeared in a recent issue of the *British Medical Journal*. There can be no doubt that this operation, often called "Pratt's Operation," is very widely practised in all parts of India. In fact the experience of Surgeons in India on operations for hydrocele is, on account of the frequency of the complaint and the large, often enormous, size of the hydroceles, far greater than that of surgeons in Europe —

"SURGICAL TREATMENT OF HYDROCELE OF TUNICA VAGINALIS"

IN the *British Medical Journal* of January 28th, 1905 p 184, a note was published on the surgical treatment of hydrocele of the tunica vaginalis by Mr E A Gaynes Doyle, Resident Surgeon Superintendent of the Colonial Hospital, Trinidad, W I. In this Mr Doyle refers to an operation performed by his chief assistant, Dr Scheult, which consists in incising and reflecting the tunica back and securing its cut edges behind the testicle by sutures. It may be of interest both to Mr Doyle and to your readers to know that this operation has for several years been extensively practised in India, where it is known as 'Pratt's Operation,' having first been performed at Fyzabad in 1893 by Lieutenant Colonel J J Pratt, I M S, now Civil Surgeon of Lucknow.

Colonel Pratt published short articles on this method, which he styled the Radical Cure of Hydrocele by Incision and Eversion, in the *Indian Medical Gazette* of August 1893, and April 1899, and since then it has been generally adopted by the medical profession in the United Provinces, and to a great extent elsewhere.

The buried sutures originally used to unite the edges of the tunica behind the epididymis have long been discarded, the evil effects of pressure of any kind on the delicate structures concerned being thus avoided. The operation as practised in this country has been highly successful in thousands of cases, and may be said to have driven all other methods of radical cure out of the field.

R. K. TANDAN, M B, C M (EDIN),

In Charge, Balrampur Hospital,

Lucknow, India "

MAJOR L G FISCHER, I M S, Civil Surgeon, Dehra Dun, was granted six weeks' privilege leave from 1st June, and Lieutenant Colonel F W Wright, I M S, holds charge in addition to his military duties

MAJOR W H ORR, I M S, has been appointed a Civil Surgeon, 1st Class, U P, *vice* Lieutenant-Colonel W G P Alpin, I M S, who has reverted to military employ

LIEUTENANT COLONEL J SYKES, I M S, becomes a Civil Surgeon, 1st Class, *vice* Lieutenant Colonel Lukis, I M S, transferred to Calcutta

THE services of Captain E J Morgan, I M S, are placed permanently at the disposal of the Government of the United Provinces, *vice* Major G B French, deceased

LIEUTENANT C H BARBER, I M S, was granted leave, on medical certificate, from 26th March to 26th April 1905

CAPTAIN H J R. TWIGG, I M S, acts as Superintendent, Central Prison, Yeravda, *vice* Captain G O Laing, I M S, deceased

CAPTAIN A. G. SARGENT, I M S, acts as Superintendent, Central Prison, Hyderabad

CAPTAIN A C MACGILCHRIST, I M S, Captain A. G. Mc Kendrick, Captain H B Foster and Lieutenant O A Gourlay, I M S, have joined the Civil Medical Department in Bengal

LIEUTENANT COLONEL P. F. O'CONNOR, C.B., I.M.S., has got an extension of leave up till 12th July 1905

CAPTAIN H. B. STEEN, I.M.S., has got five months' extension of leave (m.c.)

CAPTAIN H. D. PEILE, I.M.S., Superintendent, Central Jail, Raipur, C.P., has been granted one month's leave from 13th May, and has since been transferred to the Punjab Jail Department.

CAPTAIN T. S. N. STOKES, I.M.S., Civil Surgeon, C.P., has been granted three months' extension of leave at home

CAPTAIN G. J. G. YOUNG, I.M.S., had charge of the current duties of the Staff Officer, Army Bearer Corps, Western Command, from 9th to 13th October 1904, both days inclusive, as an additional duty, under Article 184, Army Regulations, India, Volume I, Part I

CAPTAIN E. L. WARD, I.M.S., took over charge of Montgomery Central Jail relieving Captain C. H. Bensley, I.M.S., going on leave.

MAJOR G. M. SMITH, I.M.S., has handed over medical charge of Gurdaspore District to Assistant-Surgeon L. K. Chand, and has been appointed Civil Surgeon of Dalhousie

WITH effect from 15th May, the services of Captain W. Glen Liston, I.M.S., are placed at the disposal of the Government of India for employment on the new Plague Research Commission

LIEUTENANT COLONEL C. H. BEATSON, I.M.S., and Captain E. A. O. Mathews, were permitted to return to duty in India

THE leave of Lieutenant G. C. I. Robertson, I.M.S., is extended till 16th September 1906

FINLAYSON-NEVILL.—On 24th May at Poona, Walter Taylor Finlayson, L.B.C.P., M.R.C.S., I.M.S., to Elizabeth Mary Dorothea, sixth daughter of the late Benjamin Nevill, of Winchester, England

LIEUTENANT COLONEL D. G. CRAWFORD contributes the following bibliography of Cholera, a list of works on the subject by I.M.S. officers, being addition to the list published in the *Indian Medical Gazette* for December 1903, p. 467, which contains 49 works, including pamphlets, by 31 authors—

Chuckerbutty, S. C. G. (Bengal, 24th January 1855)

* "Cholera, its Symptoms, Clinical History, Pathology, Diagnosis, Prognosis, Treatment, and Prophylaxis" Reprinted from the "Indian Annals of Medical Science" 8vo Calcutta, 1867

Hutchinson, G. (Bengal, 1st October 1868)

* "Cholera, its Cause, and Mode of Dissemination" 8vo Lahore, 1885

Jameson, J. (Bengal, 25th June 1897)

"Report on the Epidemic Cholera Morbus as it visited the Territories subject to the Presidency of Bengal in the years 1817, 18, 19" Drawn up by order of the Government under the superintendence of the Medical Board, Calcutta Printed at the Government Gazette Press

Macnamara, N. C. (Bengal, 4th November 1854)

(1) "A Treatise on Asiatic Cholera." 8vo J. & A. Churchill, London 1870

(2) "Letter, with Tables, &c., from Mr Macnamara, Surgeon, Calcutta, to Mr Simon, F.R.S., Medical Officer to the Privy Council"

Macpherson, John (Bengal, 4th December 1839)

"Cholera in its home, with a sketch of the Pathology and Treatment of the Disease." 8vo John Churchill and Sons, London, 1866

Macrae, R. (Bengal, 31st March 1875)

* "Cholera and Preventive Inoculation in Gaya Jail" 8vo Thacker, Spink & Co., Calcutta, 1894 Reprinted from *Indian Medical Gazette*

Playfair, G. R. (Bengal, 3rd November 1844)

"Report on Epidemic Cholera in the Agra Central Prison," 1861

Pringle, R. (Bengal, 4th October 1851)

"Quarantine as a preventive measure against Cholera Invasion."

Balfour, E. G. (Madras, 2nd June 1836)

* "The Localities of India exempt from Cholera" 8vo Madras, 1856

Searls, C. (Madras, 8th May 1815)

"Cholera, its Nature, Causes, and Treatment" 8vo London, 1830

* An asterisk prefixed to the title of a work signifies that it is a pamphlet or short article The dates after the author's names are those of their entering the service

BIBLIOGRAPHY OF DYSENTERY AND DIARRHOEA—A LIST OF WORKS ON THE SUBJECT BY OFFICERS OF THE I. M. S.

The subject of dysentery and diarrhoea has not formed so prolific a field for authorship as has that of cholera. Still, a good many works on these diseases have, from time to time, been published by Indian authors

In addition to those works and articles which deal specially with these two diseases, they have, of course, been considered at length in these books which cover the whole field of tropical diseases. Among the most important of the latter we may mention Annesley's "Sketches of the most prevalent Diseases of India" (1825), Lind's "Tropical Diseases" (1768 and subsequent editions), Twining's "Clinical Illustrations of the more important Diseases of Bengal" (1832), Goodeve's and Birch's "Hints on Children in India" (1844 and subsequent editions up to 1902), Morehead's "Clinical Researches on Disease in India" (1856), Moore's "Manual of Family Medicine for India" (1861 and subsequent editions up to 1903), Maclean's "Diseases of Tropical Climates" (1886), and many other works by others than officers of the I.M.S., especially Manson's "Tropical Diseases" (1898)

An asterisk prefixed to the title of a work signifies that it is a pamphlet or short article The dates after the author's names are those of their entering the service.

Bensley, E. C. (10th February 1850)

"On the Diarrhoea of Infants in India" Calcutta, 1867

Chevers, N. (1st August 1848)

* "On the Diarrhoea of Infants in India" Calcutta, 1851

Chuckerbutty, S. C. G. (24th January 1855)

* "Cases Illustrative of the Pathology of Dysentery, with Remarks" Calcutta Military Orphan Press, 1865

Crombie, A. (30th March 1872)

* Article on "Hill Diarrhoea" in "A Manual of Medicine" Edited by W. H. Allchin Vol. V "On Diseases of the Digestive System" Macmillan & Co., London, 1903

Davidson, D. M. (1st October 1887)

* Article on "Dysentery" in Davidson's "Hygiene and Diseases of Warm Climates" Edinburgh and London Young J. Pentland, 1893

Duncan, A. (30th March 1878)

* Article on "Dysentery" in Third Edition of Quain's "Dictionary of Medicine" Longmans, Green & Co., London, 1902

Ewart, J. (20th December 1853)

* Article on "Dysentery" in First Edition of Quain's Dictionary of Medicine Longmans, Green & Co., London, 1882

Fayrer, J. (29th June 1850)

(i) "Tropical Dysentery and Chronic Diarrhoea" London J. and A. Churchill, 1881

(ii) * Article on "Tropical Diarrhoea" in Davidson's "Hygiene and Diseases of Warm Climates" (v supra)

Goodeve, E. (8th March 1841)

* Article on "Diarrhoea," in Vol. I of "A System of Medicine." Edited by J. Russell Reynolds 3 vols Macmillan and Co., London, 1866 Second Edition, 1870

Grant, A. (11th November 1840)

* "Remarks on the Hill Diarrhoea and Dysentery, with brief notices of some of the Himalayan Sanitaria." Bishop's College Press, Calcutta, 1853 (Reprinted from *Indian Annals of Medicine*, 1853)

Hare, E. (24th February 1839)

* "Hints for an improved treatment of Remittent Fever and Dysentery" Delhi Press, 1847

Macleod, K. (1st April 1865)

* Article on "Choleraic Diarrhoea" in Quain's "Dictionary of Medicine" 3rd Edition, 1902

Macnamara, N. C. (4th November 1854)

* Article on "Choleraic Diarrhoea" in Quain's "Dictionary of Medicine" First Edition, 1882

Poole, G. K. (14th March 1855)

* "Thesis on the Connection of Hepatic Abscess with Dysentery."

Raleigh, E W W (15th March 1826)

"Observations on Idiopathic Dysentery, as it occurs in Europeans in Bengal, particularly in reference to the Anatomy of that Disease" W Thacker & Co, Calcutta, 1852.

Sutherland, J S (16th November 1834)

"Mercury in Fevers, Dysentery, and Hepatitis, as they occur in India, and with reference to lesions in mucous surfaces and glandular structures" Edinburgh MacLachlan and Stewart, 1846

Wade, J P (4th April 1783)

"Select evidences of a successful method of treating Fever and Dysentery in Bengal" London, 1791

Maclean, W C (Madras, 27th April 1838)

* Article on "Dysentery" in Vol I of Russell Reynolds' "System of Medicine"

LIEUTENANT COLONEL T R MULRONEY, I M S, Civil Surgeon, Amritsar, has been permitted by His Majesty's Secretary of State for India to convert the period from the 16th of January to the 14th of April 1905 of the furlough granted to him in *Punjab Government Gazette* Notification No 177, dated the 17th of February 1904, into "study leave"

ON transfer from Rawalpindi, Senior Assistant-Surgeon Miran Bakhsh, Utard, is appointed to officiate as Civil Surgeon of Attock, and assumed charge of his duties on the forenoon of the 15th of May 1905, relieving Captain E L Perry, I M S., proceeding on leave

MAJOR H M MORRIS, I M S, assumed charge of the duties of Civil Surgeon, Jhelum, on the forenoon of the 28th of May 1905, relieving Lieutenant W W Jendwine, I M S

MAJOR W H OGILVIE, I M S, assumed charge of the duties of Civil Surgeon, Jhelum, on the forenoon of the 31st of May 1905, relieving Major H M Morris, I M S

SENIOR ASSISTANT SURGEON KRISHEN CHAND, Officiating Civil Surgeon, was relieved of the additional charge of the Civil Hospital, Gurdaspur, on the forenoon of the 29th of May 1905

MAJOR F W GEE, I M S, has been granted two weeks' extension of leave

ASSISTANT SURGEON A R. PATTERSON has been granted three months' extension of leave on medical certificate

CORRESPONDENCE—Army Order 89 of 1905 is republished for information and guidance—

Signature of Orders and Correspondence in Military Commands

1 The use of the expression "By order" in official correspondence will be discontinued. The third and following sentences of paragraph 2084 of the King's Regulations are hereby cancelled

2 Orders are to be preceded by a statement showing by whose authority they are issued, e.g., "Divisional orders by the General Officer Commanding, 1st Division", "Artillery Brigade orders by the Officer Commanding, 1st Brigade, Royal Field Artillery." These orders will be signed by a staff officer, who will add to his signature his rank and the title of the appointment he holds on the staff

3 Staff officers issuing orders in the form of memoranda to units, or to individual officers, will sign as above described, and such memoranda will be accepted as conveying the orders of their superior officer

THE services of Lieutenant A. D. Pridham, I M S., are replaced at the disposal of H E the Commander in Chief from 15th June

LIEUTENANT-COLONEL J McCLOUGHRY, F.R.C.S.I., I M S., to officiate as Principal Medical Officer, Karachi Brigade, *vice* Colonel J P Greany, M D, I M S., transferred to the Civil Department.

CLOTHING—BRITISH TROOPS.—The Government of India have approved* of the adoption of a new pattern of khaki drill frock for British troops in which a rolled collar has been adopted and a plait down the back. The quality of the drill remains the same, and waistcocks will be worn only by those units at present authorised to wear them

2 Stocks of the existing patterns will be used up before frocks of the new patterns are issued

3. The new pattern will like the present pattern be interchangeable with that worn in the Colonies

LIEUTENANT W L TRAFFORD I M S, was granted leave, in India, from 6th to 22nd April 1905

LIEUTENANT L COOK, M B, I M S, is appointed to the officiating charge of 10th Jats

LIEUTENANT COLONEL D B SPENCER, I M S, is posted to the medical charge of 11th Rajputs

CAPTAIN C A SPRAWSON, M B, I M S, is appointed to the medical charge of 12th Pioneers

CAPTAIN E H B STANLEY, I M S., is appointed to the medical charge of 23rd Gurkha Rifles

CAPTAIN T S NORIS, I M S, has been appointed Civil Surgeon of Nasik

LIEUTENANT COLONEL R. J BAKER, I M S., is appointed Civil Surgeon of Karachi, *vice* Lieutenant-Colonel McCloghry, I M S, promoted

CAPTAIN W O'S MURPHY, I M S, acted temporarily as Special Port Health Officer, Karachi

LIEUTENANT H E SMITH, I M S., Regimental Medical Officer, Buxa Duars, holds civil medical charge of Buxa, District Jalpaiguri, *vice* Captain J Davidson, I M S

DR. R S ASHE, Civil Surgeon, Faridpur, was allowed one month's privilege leave from 28th May 1905

DR K L SANYAL was appointed Civil Surgeon of Bogra from 16th May 1905

CAPTAIN G J G YOUNG, I M S, was granted leave for eight months. Pension service five years, commenced 28th June 1904

FIELD Service tables for British and Native Field Hospitals and Field Medical Store Depôts have been issued

LIEUTENANT COLONEL C H BEATSON, I M S, is appointed P M O, Derajat and Bannu Brigades, *vice* Lieutenant-Colonel G J Kolhe, I M S, vacated

LIEUTENANT COLONEL D SEMPLE, R.A.M.C., has retired from the service and has been appointed Director of the Central Institute, Kasauli

SAMPLES OF WATER FOR ANALYSIS—Cases having repeatedly occurred in which samples of water for analysis have been sent to the Command Sanitary Officer in bottles which have not been sterilised, attention is drawn to the fact that a bacterioscopic examination is worthless under these circumstances

In future when such examination is required, the Command Sanitary Officer should be communicated with before samples are sent, and his instructions should be most carefully carried out, and a certificate to this effect from the officer sending the sample attached thereto

CONSEQUENT on the leave of Lieutenant-Colonel T H Sweeny, I M S, Civil Surgeon of Benares, Lieutenant Colonel G A. Emerson, I M S, acts as Civil Surgeon, 1st Class

LIEUTENANT W D BARTLEY, I S M D, attached to the Medical Store Depôt, Madras, has been granted three months' privilege leave.

MAJOR V G DRAKE-BROOKMAN, I M S, Agency Surgeon, East Rajputana States, got privilege leave for one month and seven days from 4th June 1905

UNDER the provisions of Articles 260, 308 (b), and 233 of the Civil Service Regulations, Lieutenant-Colonel C S Rundle, I M S, is granted privilege leave for two months and twenty one days and furlough to Europe for one year, nine months and nine days in continuation thereof, with effect from the date on which he may avail himself of the privilege leave

ON his return from leave Major C N Bensley, I M S, is posted to the civil medical charge of the Thayotmyo District in place of Lieutenant-Colonel C S Rundle, proceeding on leave.

WITH reference to Military Department Notification No 27 of 1905, the designation of the following officers will in future be as shown below

- (1) Medical Store keeper, Calcutta, to be Medical Store keeper to Government, Calcutta
- (2) Medical Store keeper, Mian Mir, to be Medical Store keeper to Government, Mian Mir
- (3) Medical Store keeper, Madras, to be Medical Store keeper to Government, Madras
- (4) Medical Store keeper, Bombay, to be Medical Store keeper to Government, Bombay
- (5) Medical Store keeper, Rangoon, to be Medical Store keeper to Government, Rangoon

CAPTAIN D G RAI, I M S, has been appointed to act as Professor of Pathology, Medical College, Madras. Captain Rai was a student of the Lahore Medical College before he went to study at Edinburgh

CAPTAIN E R. ROST, I M S, took charge of the Plague Hospital, Rangoon, on 11th May 1905

LIEUTENANT-COLONEL E R W CAROLL, I M S, took three months' privilege leave, and Captain A Leventon, I M S, acted as Civil Surgeon of Lakhimpur, Assam

CAPTAIN G O L. KERNANS, I M S, is appointed Civil Surgeon of Cachar

CAPTAIN W GLEN LISTON, I M S, is placed on special duty under the Sanitary Commissioner, India, with effect from 18th May 1905

MAJOR D G MARSHALL, I M S, returned from the service with effect from 24th June 1905. He has been for some time on the temporary half pay list.

LIEUTENANT COLONEL H E BANATVALA, I M S, Civil Surgeon of Nimar, C P, has been granted six weeks' privilege leave

ASSISTANT SURGEON DURGA NUNDA SEN is appointed to be a Civil Surgeon, and is posted to Malda

LIEUTENANT COLONEL T GRAINGER, I M S, is appointed to be the Civil Surgeon of Hazaribagh, *vice* Lieutenant-Colonel Macrae, promoted, but will continue to act as Civil Surgeon of Muzafferpore, where he is at present stationed

MAJOR B H DEARE, I M S, at present on leave, is appointed to be Civil Surgeon of Champaran, *vice* Lieutenant-Colonel F R Swaine, I M S, retired

LIEUTENANT COLONEL H J DYSON, I M S, is appointed to be Civil Surgeon of Saran, *vice* Major D M Moir, I M S, transferred, but will continue, until further orders, to act as Civil Surgeon of Bhagalpur, where he is at present stationed

LIEUTENANT COLONEL H J DYSON, I M S, is appointed, with effect from the 26th February 1905, to act as a Civil Surgeon of the first class, during the absence, on leave, of Lieutenant Colonel R. Cobb, I M S, or until further orders

CAPTAIN H B FOSTER, I M S, took over charge of the duties of Civil Surgeon of Dinajpore on 28th May 1905

CAPTAIN A MCKENDRICK, I M S, took over charge as Civil Surgeon of Nadia District on 31st May 1905

DR L G FINK took over charge of the duties of Civil Surgeon, Mergui, on 12th May 1905

MEDALS—SOUTH AFRICA—Silver medals for South Africa have been received for the individuals named below. Any one acquainted with the present address of either is requested to notify the same to the Principal Medical Officer, His Majesty's Forces in India, Simla—

Nur Husan Sabir, late No 694, Hospital Assistant, Indian Subordinate Medical Department (Bengal Establishment)

V A Narayanasawmy, late No 1197, Hospital Assistant, Indian Subordinate Medical Department (Madras Establishment)

CAPTAIN F D BROWNE, I M S, Superintendent, Central Jail, Jubbulpore, was granted one month's privilege leave

On transfer from Amritsar, Major S Browning Smith, I M S, held charge of the office of Assistant Plague Medical

Officer, Lahore, from the 27th of March to the 4th of April 1905, both days inclusive

He was appointed Chief Plague Medical Officer, Punjab, from the afternoon of the 4th of April 1905, relieving Major E Wilkinson, I M S, who reverted to his substantive appointment of Deputy Sanitary Commissioner, Punjab, on proceeding on leave

Punjab Government Notification No 407, dated the 19th of April 1905, is hereby cancelled

CAPTAIN E L PERRY, I M S, Officiating Civil Surgeon, Attock, has obtained privilege leave of absence for three months and furlough on medical certificate for nine months in continuation thereof, under Articles 260, 233 and 308 (a) of the Civil Service Regulations, with effect from such date as he may have availed himself of it

LIEUTENANT COLONEL R J BAKER, M D, I M S, is granted from the date of relief, such privilege leave as may be due to him on that date, in combination with furlough for such period as may bring the combined period of absence up to six months

His Excellency the Governor in Council is pleased to make the following appointments—

Major B B Grayfoot, M D, I M S, to act as Civil Surgeon, Karachi, *vice* Lieutenant-Colonel R. J Baker, M D, I M S, proceeding on leave, pending further orders.

Major W S P Ricketts, M B, I M S, to act as Medical Officer to the Kathiawar Political Agency and in charge of the West Hospital, Rajkot, *vice* Major B B Grayfoot, M D, I M S, pending further orders

At an examination held at Quetta, Captain A Spitteler, I M S, passed in the Brahui language

CAPTAIN J N WALKER, I M S, Civil Surgeon, Azamgarh, was granted 41 days' privilege leave from 12th June 1905

MILITARY ASSISTANT SURGEON R. T RODGERS officiated as Civil Surgeon, Amraoti, and Superintendent of the Central Jail from 21st March till 1st May 1905

CAPTAIN E O G MADDOCK, I M S, is granted thirteen months' leave out of India, including 60 days' privilege leave and five months' study leave

LIEUTENANT-COLONEL J G MARSDEN, I M S, returns from leave on 3rd October 1905

CAPTAIN H KIRKPATRICK was granted six months' leave up to 14th November 1905

CAPTAIN P P ATAL, I M S, was granted one month and eighteen days' privilege leave, up to 6th July 1905

CAPTAIN D MCCAY, M B, I M S, is appointed to be Professor of Physiology in the Medical College, Calcutta.

LIEUTENANT COLONEL J LEWTAS, M D, I M S (Bengal), Professor of Ophthalmic Surgery in the Medical College, Calcutta, and Ophthalmic Surgeon, College Hospital, is granted privilege leave for one month and twenty seven days with special leave out of India, on urgent private affairs, for four months and three days in continuation, with effect from the 23rd June 1905

MAJOR F P MAYNARD, M B, F R C S, I M S (Bengal), Civil Surgeon, Darjeeling, is appointed to officiate as Professor of Ophthalmic Surgery in the Medical College, Calcutta, and Ophthalmic Surgeon, College Hospital, during the absence on leave of Lieutenant-Colonel J Lewtas, M D, I M S (Bengal), or until further orders.

THE services of Captain N S Wells, M B, I M S, are placed temporarily at the disposal of the Hon'ble the Chief Commissioner of Assam

THE services of the undermentioned officers are placed permanently at the disposal of the Government of Bengal—

Captain S Anderson, M B, I M S

Captain J W F Rait, M B, I M S

Captain H Innes, M B, I M S

Captain J C H Leicester, M D, F R C S, I M S

LIEUTENANT COLONEL H C BANNERJI, I M S, Civil Surgeon, Nadia, is granted sick leave for one year, and Captain Anderson McKendrick, I M S, officiates as Civil Surgeon, Nadia

CAPTAIN J C H LEICESTER, M D, I M S, is granted six months leave, including three months' study leave

LIEUTENANT COLONEL M A T COLLIE, I.M.S., was granted one month's privilege leave from 18th May 1905

MAJOR O H L MEYER, M.D. I.M.S., was appointed to act as Presidency Surgeon, 3rd District, Bombay, *vice* Lieutenant Colonel Collie, I.M.S., on leave

THE following appointments were made recently to the staff of the J J Hospital, Bombay—

Mr C Efford, L.D.S., to be Honorary Surgeon on Dentistry, and Mr C Fernandez, L.M.S., to be Honorary Physician in Skin Diseases (*sic*) at the Jamshedji Jijibhai Hospital.

ASSISTANT SURGEON D E KOTHAVALA was appointed Civil Surgeon of Branch, *vice* Major W S P Ricketts, I.M.S.

CAPTAIN H R J TWIGG, I.M.S., took over charge as Superintendent, Yeravda Central Prison on 30th May

AN examination for fourteen commissions in I.M.S. was held in London on 25th July 1905

CAPTAIN E A C MATHEWS, I.M.S., is appointed to the medical charge of 10th (D.C.O.) Lancers (Hodson's Horse)

THE following appeared in E.C. orders, dated 9th June 1905—

"No 421 REPORTS—ARRIVAL AND DEPARTURE.—With reference to Army Regulations, India, Volume II, paragraph 159, it is notified that Mussoorie is, for the purpose of that paragraph, a Military Station. All officers arriving at or departing from Mussoorie, are required to report themselves either personally or by writing to the Station Staff Officer, Landour"

THE services of Captain W D Richie, I.M.S., are placed permanently at the disposal of the Government of Assam

LIEUTENANT COLONEL J MCCLOGHRY, I.M.S., Bombay, is granted the temporary rank of Colonel whilst officiating as Principal Medical Officer, Karaohi Brigade, *vice* Colonel J P Grenny, M.D., I.M.S., Bombay, appointed to officiate as Surgeon General with the Government of Bombay, with effect from the 24th May 1905

THE Governor General in Council is pleased to sanction, with effect from the 17th December 1904, the following promotions of members of the Indian Subordinate Medical Department, under the provisions of paragraph 470, Army Regulations, India, Volume II, in recognition of their service with the Tibet Mission Escort—

First Class Assistant-Surgeon Richard Corridon to be Senior Assistant-Surgeon (supernumerary), with the honorary rank of Lieutenant, subject to His Majesty's approval

No 709, First Class Hospital Assistant Azhar Hussain to be Senior Hospital Assistant, Second Class (supernumerary)

No 859, Second Class Hospital Assistant Muhammad Amri to be First Class Hospital Assistant (supernumerary)

No 917, Second Class Hospital Assistant Tika Ram to be First Class Hospital Assistant (supernumerary)

The promotion of Hospital Assistants Muhammad Amir and Tika Ram is subject to their passing the qualifying examination within twelve months of the date of this notification

LIEUTENANT E A WALKER, I.M.S., took over the civil medical duties of Maidan Sub-division relieving Captain H M Cruddas, I.M.S., on 27th May

CAPTAIN L J M DEAS, I.M.S., became Civil Surgeon of Peshawar on 27th May

LIEUTENANT E P CLEMENTS, I.S.M.D., Civil Surgeon of Hardoi, U.P., was granted six weeks' privilege leave, and Major J G Hulbert, Civil Surgeon of Shahjahanpur, held *visiting* charge of Hardoi District

CAPTAIN A C MACGILCHRIST, I.M.S., is appointed temporarily to act as a Civil Surgeon and is posted to Midnapore

MAJOR F O'KINEALY, I.M.S., is appointed to act as Civil Surgeon of Darjeeling during the absence, on deputation, of Major F P Maynard, I.M.S., or until further orders

CAPTAIN J W D MEGAW, I.M.S., on special duty, is appointed to act as Resident Physician, Medical College Hospital, during the absence on deputation, of Captain E E Waters, I.M.S., or until further orders

CAPTAIN W V COPPINGER, I.M.S., is appointed temporarily to act as a Civil Surgeon and is posted to Jalpaiguri, with effect from the forenoon of the 5th May 1905

DR. R H PULIPAKA, Civil Surgeon, is transferred from Jalpaiguri to Rangpur, with effect from the afternoon of the 7th May 1905

CAPTAIN G KING, I.M.S., is appointed temporarily to act as a Civil Surgeon and is posted to Jessore, with effect from the 12th May 1905

CAPTAIN KING, I.M.S., has, since the above notice was gazetted, been transferred to Bhagalpore to act for Lieutenant-Colonel H J Dyson, I.M.S., granted sick leave

LIEUTENANT O A GOURLAY, I.M.S., has been appointed Deputy Sanitary Commissioner, Metropolitan and Eastern Bengal Circle, *vice* Captain Clemesha, I.M.S., appointed Officiating Sanitary Commissioner, Bengal

CAPTAIN H B FOSTER, I.M.S., is posted to Dinajpore as Civil Surgeon

DR. MAUNG PHA TAW, M.R.C.S., M.D. (Brit.), is appointed Civil Surgeon of Kyaukpada District, Burma

CAPTAIN P DEE, I.M.S., has been granted three months extension of leave (*m.c.*)

MAJOR E G R. WHITCOMBE, I.M.S., Medical Officer, 35th Jacob's Horse, has been granted one year's leave. Fifteenth year pension service commenced on 31st January 1905

IN supersession of all previous orders on the subject, the following instructions regarding the wearing of helmets by officers in India, are published for information—

Wolseley Pattern Khaki Helmet

- (1) Will be worn by officers serving with *British Units*, when parading with their men, in all orders of dress
- (2) By all other British officers when in khaki except when the Lungi is worn

Other Helmets

- (3) The existing patterns of white or regimental helmet will be worn by Staff and Departmental officers in all orders of dress, except khaki, and by officers serving with British units, on ceremonial occasions, when not parading with their men
- (4) White, drab, or rifle green helmets, of existing pattern, will be worn by British officers of the Indian Army in all orders of dress, except khaki and except when the Lungi is worn instead

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co., Calcutta

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs Thacker, Spink & Co., Calcutta

Annual Subscriptions to the *Indian Medical Gazette*, Rs 12, including postage, in India Rs 14, including postage abroad

BOOKS, REPORTS, &c, RECEIVED

Diagrams used in Sanitary Exhibition at the King Institute
Eye, Ear and Throat Nursing F. A. Davis Co.
Practical Pediatrics, Sheffield F. A. Davis Co.
Plague Report from Manila, by Herzog
Glanders, Manila Report, by Wherry
Bidwell's Intestinal Surgery
Bengal Sanitary Report
United Province Sanitary Report.
Assam Hospitals Report.
Assam Medical Report

LETTERS, COMMUNICATIONS RECEIVED FROM—

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Original Articles.

EXTRACTION OF CATARACT IN THE CAPSULE

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THE attitude of ophthalmologists outside India towards extraction of cataract in the capsule is fairly represented by Mr F. Richardson Cross, in a paper read at the British Medical Association Meeting—Ophthalmic Section—at Cheltenham in 1901, on the treatment of after-cataract, in which he incidentally remarked that "the ideal extraction of a cataract is that of the whole lenticular body in its capsule. But this is only safe under exceptional circumstances," and this view was tacitly accepted by the meeting.

I have now seen enough of the junior operating ophthalmic surgeons in India, to know that many of them agree with me, not only as to the theoretical excellence of extraction of cataract in the capsule, but also as to its excellence as a practical operation, and that extraction in the capsule should be the operation of election to which the exceptions would be few. I hope to show that the results are incomparably better in every respect than when the capsule is left behind as in the ordinary operation. From the number of junior members of the profession who came to me to see the operation performed and who I know are practising it, I have reason to hope that in the near future it will become established in Northern India as firmly as litholapaxy is established. We have got the same professional opposition to contend with as litholapaxy had in its early days, a class of opposition due to the fact that there are more aspects of practical surgery than the purely scientific one.

The details of the operation which I perform are my own. My personal experience extends to over 11,000 cataract extractions; of these, about 2,000 were performed by the orthodox method of scratching the capsule and leaving it behind and over 9,000 were extractions in the capsule. Those extracted by capsulotomy were, generally speaking, my earlier operations. In them, when a nervous patient was operated on under cocaine, it occasionally happened, that when the incision was made, before there was time to take out the speculum, the patient, by screwing up the orbicularis muscle, put pressure on the eyeball and shot out both the lens in its capsule and a quantity of vitreous. I was agreeably surprised to find that these cases generally turned out well in every way. The observation of this accident and its results induced me to perform extraction in the capsule as a systematic operation modifying details as experience dictated.

Table showing results of cases submitted to extraction in the capsule at Jullundur Civil Hospital from the 31st May 1904 to the 31st May 1905

Nos	Iritis	Escape of vitreous	Capsule bursting	Capsule left behind	First Class results	Second Class results	Failures
	Per cent	Per cent	Per cent	Per cent			
2616	0.3	6.8	8	4.28	99.27	0.38	0.34

Preliminary inspection of the eye to be operated on—The trained eye of the surgeon, aided only by the finger-tips, will supply more information than all the instruments that have yet been devised for this purpose. The patient's eye can be properly inspected only when he is lying on his back in a good light, from which the direct rays of the sun are excluded. The appearance of the sclerotic, the lustre of the iris, the position of the iris, the position of the lens, and the reaction of the pupil to light will reveal to the naked eye all that is required as far as cataract is concerned, except in the very rarest of circumstances. The reaction of the pupil to light is almost as accurate an indicator of the visual acuteness of the retina as the galvanometer is of an electric current.

In these days of respect for the infallibility of Western teaching and contempt for our powers of observation, and capacity for weighing facts in the East, and for univalued experience, it is amusing to meet a man in India who has gone to Europe to have his cataract extracted, who on returning consults us on his after-cataract and supplies us with the written out statements by a few of the leading men in Europe on the condition of the eye before it was operated on, laying down, that the cataract was ripe, and that there were slight opacities in the vitreous and other such things behind an opaque lens. How they can see in through an opaque lens through which the patient cannot see out further than to recognise light from darkness is to me a mystery. "Folk maun do something for their bread an' sae maun death."

For practical purposes, and having regard only to the operator's point of view, I classify cataracts as follows—

I In children—

- (a) Soft, that is, of milky consistency
- (b) Gelatinous, that is, of gelatinous-consistency

II In adults—

- (a) Hard
- (b) Semi-soft, that is, a core surrounded by juice of milky consistency
- (c) Semi gelatinous, that is, a core surrounded by material of grape juice-consistency
- (d) Atrophic.

The operator, before he has made his incision, can diagnose each of these varieties with accuracy, hence the importance of the classification. Cataract in children and atrophic cataract are not suitable for extraction in the capsule. In the semi-gelatinous variety the lens occasionally has a peculiar bluish tinge. These cases also are unsuitable for extraction in the capsule, for, the capsule is weak and liable to become ruptured during the operation allowing the core and lens-matter to escape, and, if the surgeon be not dextrous, it will retract together with some lens-matter, so that, the ultimate effect on the eye is no better than if the operation had been performed by scratching the capsule.

Out of the 2,767 cataracts operated on by me at this hospital during the year, I decided that 151, or 5.4 per cent, were unsuitable for extraction in the capsule. Sixty-seven of these were in children and 84 were in adults, so that, among the adults I excluded about 3 per cent from this operation. Having decided that the case is suitable for extraction in the capsule, and the usual preliminaries having been gone through, I make a liberal-sized upper incision inserting the knife at the sclero-corneal junction just as deep as anatomy, and experience teach us will avoid wounding the dangerous area, and cut out in the cornea with a sweep half-way between a normal pupil and the sclero-corneal junction. I then take out the speculum, and my assistant hooks up the upper eyelid on an ordinary large-sized strabismus hook, and draws down the lower lid by placing the ball of his thumb on the skin of the face close to the lower eyelid. He lifts the upper lid well up with the strabismus hook, and relaxes his hold on neither the upper nor the lower lid until the operation is finished. It is important that he should lift the upper lid well up, and retain the lower one so well down that the orbicularis muscle cannot be brought into action by the patient until the operation is finished. The importance of a thoroughly competent and reliable assistant in this matter cannot be over-estimated. Assuming that the operator is skilled in ophthalmic manipulation, it is the free action of the orbicularis muscle in almost all cases which causes escape of vitreous. I consider it of supreme importance to impress this fact upon any one attempting the operation. I then place the curve of a strabismus hook over the corner about the junction of the lower with the middle third of the lens, and a spoon just above the upper lip of the wound. I press the strabismus hook down neither towards the wound nor from it, and do not alter its position until the lens is nearly out, all the time making slow, steady, and uninterrupted pressure and counter-pressure. When the lens is more than half-way out I, while keeping up the tension with the spoon in its original position, shift the strabismus hook forward and gently tilt the lens by getting the edge of it in the concavity of the strabismus hook. If this latter manoeuvre be

done with the spoon or other comparatively sharp instrument, or with the slightest roughness or jerk, the capsule will give way and allow the body of the lens to escape, and, if the operator be not dextrous, will itself retract with some contained lens-matter, and, being in part dislocated, will give trouble in its removal. I shall deal with the removal of such capsules later on. The lens in its capsule being out, the eyelids are let go and bandaged up with the usual antiseptic pad. If a trace of vitreous has escaped, it is snipped off with scissors, and if the iris prolapses, it is replaced before the eyelids are let go. In the case of non-indectomy extractions the slow, steady strain of the lens on the pupil tires out the muscle of the iris, and the pupil gently relaxes as the muscle tires. There is no advantage in a preliminary instillation of atropine. I have frequently thus extracted the lens in its capsule in opium-eaters, in which the pupil was contracted with opium, without atropine and without difficulty. This slow, steady proceeding also allows time for the lens to become gently dislocated. The operator who attempts to extract the lens in its capsule either with or without an indectomy as rapidly as is done when the capsule is scratched, will have disastrous results. By over-rapid expression the capsule will burst. I find that the whole operation takes from two to three minutes—twenty to thirty cataracts in the hour. The only sponging, washing, or douching, I use is a preliminary washing out of the conjunctiva with a 1 in 2,000 perchloride of mercury solution. After the lens in its capsule comes out, if we go "fiddling," we are sure to have an escape of vitreous. The lids on closing are quite sufficient to drive out any fluid there may be, vitreous or other, except blood. Blood should not escape in a cataract operation beyond the merest trace, which can be neglected. The operation I perform with an indectomy differs in no way from the above, except in the indectomy. The corneal wound I make is very little larger than is necessary for the safe extraction of cataract by the ordinary method.

I have before called attention to the capsule giving way when the lens is partly out. Of the 2,616 cases submitted by me to extraction in the capsule in the current year, the capsule gave way in 8 per cent. In about half of these I was able to catch the capsule hanging out of the wound with its contained lens-matter, thus leaving the capsule behind in 4.28 per cent of the cases. This is the most serious complication in this form of operation. The operator at this juncture should keep up sufficient pressure with the strabismus hook in his right hand to prevent the capsule retracting, and, lifting an ordinary dissecting forceps with his left, he should catch the capsule and bring it with its contained matter with him. If the capsule has retracted, we should try by gentle stroking to press out its contained lens-matter—thus the

experienced operator will generally succeed in doing—and if the capsule be evident to the eye, we may make an attempt to catch it with an iris forceps and fetch it out. If we cannot do this latter by one or two careful attempts, we should desist and watch events.

Escape of vitreous, so much dreaded, though not a desirable thing, I have seldom seen evil consequences from. In the 2,616 cases under consideration, escape of vitreous amounted to 6.8 per cent, and in only three of them did I see evil consequence attributable thereto. Cases in which the amount of escape has been small seem to do just as well as others. The vitreous seems to repair as well as any other tissue, and why should it not? The place of escaped vitreous is either taken by aqueous humour or is renewed, and the tension of the eye does not seem to suffer unless the escape be considerable. In the cases noted in the table in this paper with nine exceptions, only a bead of vitreous escaped. The nine exceptions were in supremely nervous patients, who shot out the lens and a quantity of vitreous the moment the incision was completed. Six of them turned out well, and three were completely lost. It may be noted that the accident in these cases would have occurred in any operation. The statistics also include the extraction of some 75 cases of lenses couched by the *rawal* (the native ophthalmic quack operator of India), and in these we are a little more likely to have an escape than in ordinary plain-sailing cases. When the lens is half-way out, or much earlier in the case of couched lenses, a clear point of vitreous will occasionally appear in the wound behind the lens. It is due to the fact that the capsule is unusually strongly anchored in part, and refuses to give way. The moment this clear point appears behind the lens when it is being expressed, the spoon in the left hand which has been making counter-pressure should be lifted, the strabismus hook in the right hand keeping the lens in position. The spoon should be pushed beneath the lens through the clear point and the lens suspended on it. Once the lens is supported on the spoon the strabismus hook can be used as before to drive out the lens, the spoon merely coming with the lens but not drawing it out. It will be observed that I use the spoon for the purposes of supporting the lens, and preventing it from putting pressure on the vitreous. If we attempt to lift out the lens on the spoon merely, the capsule will give way with exceeding frequency. The manoeuvre I recommend is in practice an easy proceeding and prevents undue escape of vitreous.

Iritis—2,494 of the 2,616 cases under consideration were extracted in their entirety in the capsule. In the remaining 112 the capsule had to be left behind. In the 2,494 cases I had two cases of iritis. In the 151 cases in which I scratched the capsule and deliberately left it behind, and in the 112 in which I was obliged

to leave it behind, iritis occurred proportionately distributed to the extent of about 5 per cent. In these 2,494 cases I had nine absolute failures, all from suppuration. Macnamara says "The greater my experience in these matters, the more convinced I am, that most of our failures in extraction are due to the fact of soft lenticular matter and capsule left in the eye after removal of the lens." I quite agree with him. Such is the cause practically of all the inflammatory troubles except undue meddling, and in no section of practical surgery is undue meddling followed by more disastrous results. There is a virtue in knowing when to quit and in letting "well enough" alone. The cases extracted by me this year were all done with an iridectomy, hence the absence of prolapse of iris. In previous years I did this operation systematically without an iridectomy unless in exceptional cases. It will be observed that iritis does not follow when the lens is extracted in its capsule, and here I do not draw a distinction between irritation of the iris and iritis, I call them both iritis. My former experience of extracting the lens in its capsule without an iridectomy led me to the same conclusion. It is generally held that iritis following cataract extraction is largely due to bruising of the iris by the lens when it is escaping, and this is also advanced as the reason why iritis follows more frequently in cases in which an iridectomy has not been done than in cases in which an iridectomy has been done, the bruising of the iris being necessarily greater. This is, in my opinion, entirely beside the mark. If extraction of the whole lenticular body in its capsule is not followed by iritis, then it follows that bruising the iris has no connection with this iritis. The iritis following cataract extraction is, in my opinion, due to the fact that lens-matter and capsule have been left behind. Why it follows oftener when no iridectomy is done than when an iridectomy is done, is due to the fact that it is more difficult to get the last traces of lens-matter out of an eye in which an iridectomy has not been done, than out of one in which it has been done, and, as a consequence, it is more often left behind.

Visual results—I find that for reading and for fine work a No 12 D to No 13 D lens is the usual one required when the capsule is removed, and that a much higher power is required when it is left behind—a fact, the importance of which is evident—when the capsule is removed, the patient can see well to do fine work—which is not the case when the capsule is left behind. When the capsule is left behind, there is invariably an after-cataract varying only in degree of density, and the patient must have it operated on before he can see fine objects properly. Mr F Richardson Cross in the paper above referred to, says "After extraction of a lenticular cataract there will always remain some fragments of altered lens or capsule as a record of the operation," and this statement was tacitly admitted by the meeting.

We occasionally hear extraction in the capsule, as we do in India, termed "Pagenstecher's operation." Pagenstecher is the only operator outside India who extracts cataract in the capsule, but his procedure is quite different from that which we adopt in India, and there is no one more ready to admit the fact, and, I think I may say, the relative weakness of the procedure he adopts than Pagenstecher himself. In Pagenstecher's operation the lens is lifted out on a spoon, which is incomparably a more difficult procedure than that which we adopt. It is more liable to escape of vitreous and to rupture of the lens capsule with all its consequences. Thus, the Indian operation and Pagenstecher's operation are about as different as any two procedures in surgery whose objects are the same result.

From the enquiries I have made concerning this operation not only from India but from Europe and America, it is plain that from no written description can a man learn to do this operation with satisfactory ease. It would apparently be as easy, or almost as easy, to learn the art of shoeing a horse from a written description as to learn how to extract cataract in the capsule with ease from reading an article on the subject. It requires to be seen. Once seen, the difficulties vanish. Here I may say that in my opinion a man will learn more about the surgical diseases of the eye including cataract, by looking on at some of our experienced Indian operators in their busy season* for one month than he will do in several years by attending post-graduate clinics and lectures on the subjects in Europe. We often hear it said that diseases of the fundus and errors of refraction are not common in India. I can speak for Jullundur. Here, we have both in quantity and in variety as much as any hospital in the world. The refraction cases are in many instances due to the system of cramming school children at tender ages in this country.

By extraction in the capsule, we practically eliminate iritis and after-cataract, both of which are serious complications. An eye in which there has been iritis after cataract extraction never recovers to be as good, as if it had not occurred, and often the result is exceedingly poor. To deal with an after-cataract is as serious as to extract a cataract in its capsule, if not more so. It is a difficult operation if orthodoxly done, and the result is often far from satisfactory. The eye in which capsule has been left, whether iritis has occurred or not, and whether the capsule has been needled or not, is liable to inflammatory reaction of a serious nature on slight provocation. Once the contents of the capsule have been removed, the capsule has no longer any function in nature to perform. It is simply a part of the lens left behind. It is injured, and it behaves on slight causes as a foreign body. When the lens has been extracted in its capsule,

the eye is no more subject to this liability to internal inflammation—iritis and iridocyclitis—than is a normal eye. On this point I find that Pagenstecher holds the same opinion. By extraction in the capsule, vision is necessarily more acute than when the capsule is left behind. Capsule left behind is invariably an after-cataract varying only in degree of density. It is always visible as such when looked at with an ophthalmoscope. By extraction in the capsule no instrument or douche need be inserted to remove lens-matter from the interior of the eye, the cause of the striped keratitis we hear of and other complications. There is no fiction applied to the cornea to remove lens-matter, and thus the minimum of injury is done to the epithelium of the cornea and conjunctiva. Hence, we see so little of that conjunctival irritation which we see in the ordinary operation and which we always hear attributed to using 1 in 2,000 perchloride of mercury and other strong antiseptics used to wash out the conjunctiva. It is not due to 1 in 2,000 perchloride of mercury solution. It is due to too much manipulation of the conjunctiva and of the corneal epithelium. As to the drawbacks to extraction in the capsule, I know of none which is not capable of being overcome by experience. I may add that extraction in the capsule is not an operation for the inexperienced. In the hands of skilful operators, extraction in the capsule is at least as much in advance of the ordinary operation as litholapaxy is in advance of lithotomy in the case of stone in the bladder.

SOME NOTES ON PLAGUE IN THE PUNJAB

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A LECTURE on the subject of "Plague in India," delivered on May 18th before the Indian Section of the Society of Arts, by Dr. Charles Creighton leads me to think that a few remarks on plague from the point of view of the medical officer with some distinct experience may not be out of place at the present time and also gives me a few pegs on which to hang them.

The main feature of the lecture is the statement of opinion that infective an, rising from the ground and inhaled by man, is the cause of the plague epidemic.

I think, before any man with practical experience of the disease will agree with this opinion, we are entitled to ask Dr. Creighton to enlighten us on the following points—

(1) Can the inhalation of "infective an" into the lungs produce clinically a chain of symptoms commencing with the enlargement of the lymphatic glands, say in the right groin or the left axilla?

* The busy season commences about the 25th of September and ends about the 10th of April.

(2) Why in a room containing say five or six persons, where presumably the "infective air" is inhaled by all, do a varying number get plague and the others escape?

The formula quoted by Dr Creighton that "infection has exhausted all the susceptible subjects" will not help us, for we know that the same family may be attacked year after year, for two, three or more successive years, plague carrying off a certain number of victims each year.

(3) When we find two villages with similar construction and sanitation, one suffering from an epidemic of plague and the other not, what is the specific factor that makes the ground air infective in the plague-stricken village?

(4) How is this specific factor spread through the village? One would suppose that the infective air from one house would spread to the contiguous houses, infecting the inhabitants in their turn, and not, as is so often the case, skipping over two or three houses to appear some little distance off.

(5) How does the "infective air" theory explain the fact that a part of a village that has been rendered rat-free escapes an epidemic of plague, while the remainder of the village suffers? Dr Creighton claims to have the support of every practical man in India, but I think until we have a definite explanation to the above questions, the practical man has sufficient justification for holding that the infective ground air theory is not supported by the facts of the case.

We know that by far the commonest history of infection of a village is the following—A man from a healthy village visits a plague-stricken one, frequently to assist at the funeral ceremonies of a relative dead of plague, on returning to the healthy village he develops symptoms of plague, three to seven days later rat mortality is noticed in the house, and three to fourteen days after this, sometimes longer, the first cases of the real epidemic occur, spreading through the village and following, not preceding the disease among rats.

This is the common history in thousands of villages in the Punjab.

Now, how can the interval between the imported case and the epidemic itself be explained when the short incubation period of plague is taken into consideration except by allowing that the infection has to be first passed to the rat from the infective excreta of the imported case, has then to spread among the rats and is then conveyed from rat to man. Direct infection from man to man cannot be responsible for the spread of the epidemic, or surely we should have the epidemic in a very much shorter period of time after the importation of infection.

It fairly commonly happens that the man visiting the plague village, returns to his own healthy one, does not develop plague himself, but the infection brought in clothing or perhaps

in grain or property, first infects the rat, and rat mortality is the first sign noticed, then follows the human epidemic in which the conveyor of infection himself may or may not fall a victim.

Infection, once started in a village, may certainly be conveyed from one part to another by man, but this man has received the infection from the rat and infects the rats in the part to which he goes, so giving rise to a separate outbreak in the same village, not directly from man to man, but indirectly through the rat.

That mud-built villages are attacked apparently much more severely than villages or towns, where the houses and floors are built of brick or stone has been a very evident fact since plague first appeared in the Punjab, I say apparently because I believe that in the end we shall find that the latter have really suffered an equal loss with the former, but in towns the epidemic will last for years, whereas in a village it will rage for a couple of months and then die out.

In England, improved dwellings and sanitation has led to the disappearance of the mus rattus, the old English black rat, by driving it from its natural habitat the floors, walls and roofs of houses, and enabling the mus decumanus which lives in sewers, drains, cellars, etc., to get the upperhand. The important relation of the domestic rat to epidemic plague depends on the fact that it lives in close association with man and not on any greater susceptibility to the disease, while the sewer rat and the field rat may be dismissed as important factors in the spread of the disease because they live apart from man except under exceptional circumstances, for instance in some localities in the Punjab where new canals have been cut and new villages sprung up, the irrigation of new land has driven enormous numbers of field rats into the villages where they have died in thousands and been the most important factor in the causation of a very bad outbreak of plague.

Now, the same conditions apply to a lesser extent in this province, and houses with masonry or brick walls, floors, etc., tend to keep down the population of the domestic rat and also to prevent intercommunication between rat colonies, whose habitat may be limited to one house, so, in mud-built villages, the importation of one case of plague will mean the rapid infection of the whole village by the rat, while in towns, human agency is the probable cause of the spread of infection from one set of houses to another, separate small colonies of rats being infected in each case, a very much slower and more uncertain process. Again, these well-built houses have usually more than one storey, and afford the inhabitants a greater chance of escaping infection by living in the upper rooms.

Let us come to another point which draws attention to the rat flea. Lieutenant Barnardo, R.M.S., has pointed out that the usual irregular incidence of plague attacks in houses, say two or

three out of six or seven being attacked, tends to show that the infection of the two or three is a chance or accidental one, and he has also drawn attention to a fact not unconsciously observed that certain houses show an extraordinary plague incidence compared with the majority, say eight or nine out of ten or a whole family being attacked. It will be found that these houses in which all or nearly all of a family are attacked with plague are always isolated ones, either standing by themselves or separated from adjoining ones by masonry or brick, while the others in which the usual incidence occurs have only mud-walls separating them from the next. What inferences may be drawn from these facts?

Were it a question of infective air rising from the ground, would we not expect the heavier incidence in the houses that are crowded together rather than in the isolated ones? I think so.

Now, the following facts are known —

- 1 That rat mortality nearly always precedes human infection in the epidemic form
- 2 That the rat flea when deprived of food by the death of its host will attack man or other animals than the rat, and the rat flea has been found on plague-stricken animals and man (Captain W. G. Linton, "Rats, Plague and Fleas," *Indian Medical Gazette*, February 1905)
- 3 That the rat flea can retain the plague bacillus alive and virulent from seven to eight days
(Giuseppe Zucchi, Rome, *Centralblatt für Bacteriologie, Parasitenkunde und Infektionskrankheiten*, Vol XXXI, No 14, June 1902)
- 4 That man is infected in the large majority of instances through the skin

The habitat of the rat flea is the rat nest and burrow round the nest, the flea does not live, that is to say, spend its life on the rat, but only goes to the rat for food, a certain number of fleas may be found on the live rat when caught, simply because the rat has left the nest while the fleas were feeding, but the majority are in the rat nest, and when rats die and the remainder leave their nests in search of a more healthy habitat, the fleas are left, and when their hosts do not return, the fleas also have to leave in search of their hosts or starve.

To go back now to our two houses, one with the usual plague incidence, the other in which every person has been attacked, in the first, some rats have died, and the rest fled along intercommunicating burrows to other rat colonies, the fleas, on finding their supply of food gone, set off in search of fresh hosts, most perhaps following the rat, others irrupting into the room by the rat dying there, a certain percentage of these contain the plague bacillus and

being hungry and accidentally finding themselves on man, they bite and infect the two or three cases out of the family of ten, before they have found their way after their natural hosts, or become non-infective. But what has happened in the other house, the isolated one? The rat burrows and nests here are confined to this house and do not communicate with others, the rats having no way of escape, suffer a very heavy mortality, the fleas become more generally infected in consequence than in the first case, nearly all the rats die, a few perhaps escaping by the door or windows, while the fleas, left to starve and with no other way out from the nests except into the room, invade the room in large numbers and, unable to find their own particular host, attack man, and being very numerous with a large percentage infected, infect the whole family.

Any one with experience of plague in villages has had the opportunity of opening one of these houses that have been evacuated and shut up, on opening the door, the room is seen to be swarming with hungry fleas, and in a minute one's leg are covered with the parasite, Barnardo placed a caged rat in one of these rooms for two hours, when it was removed 174 fleas were found on it. On the admission of light, the fleas soon disappear into holes and dark corners, the flea is a nocturnal one and shuns the light, and this is the most probable explanation of the danger of passing the night in an infected house, the flea is practically absent from the open room in the daytime and the risk of infection is then small.

I hope we shall soon definitely settle how long such a room remains infective.

Although I cannot agree with Dr. Creighton that the inhalation of infective ground air is the cause of plague epidemics, his observations are of much value. Marsh has shown that the plague bacillus flourishes particularly luxuriantly on agar cultures when buried beneath the mud and cow-dung floors of native houses, and considers this to be chiefly due to excess of CO_2 in the ground air, just as the preservation of the infective agent in the body of the rat with chronic plague may be one important factor, so the ground air, surcharged with CO_2 , may very possibly be another in keeping the plague bacillus alive and virulent in the soil under certain conditions, and so preserving it through the period when the disease among man has died out, ready on the re-appearance of the rat to start rat plague once more, thus constituting what may be called an endemic centre.

A very large number of villages badly infected in one season are again attacked usually in the spring of the following plague season with an epidemic milder in character than the first, without any history of re-importation of infection, but where the first sign is the appearance of rat mortality. One cannot imagine that the original epidemic ceased in the village because the infec-

tive agent, the plague bacillus, had perished, for one would imagine soil infection to be greatest towards the end of the epidemic after a large number of plague-stricken men and rats had soiled the ground with infective excreta, but rather because the death and flight of rats from the locality had removed a link from the chain of infection, it does not seem to me an unreasonable theory to suppose that the infective agent, innocuous because of the absence of the rat may become less or non-virulent, so that rats, even if they return, are not affected by it, but that during the subsequent cold season, the continual exposure to air with an excess of CO₂ consequent on the crowding of families into houses may so affect the bacillus that its virulence is again gradually exalted until such a point is reached when it can again affect the rat which in the meantime has bred again into considerable numbers, and so produce the second epidemic in the spring.

The recrudescence of plague in the spring in a large number of villages infected in the previous season without fresh importation is, I think, a part of the explanation of the increase in plague figures at this period in the Punjab at any rate. Spring is also the time when fleas are most numerous, and possibly it may be their principal breeding season, this may also be a part.

This question of endemic centres is, in my opinion, the most important one of all to be answered with regard to a practical plague policy, it must be admitted that we do not import plague yearly from Bombay, but that, at the end of the so-called "free season," the period when no plague cases and deaths are reported, there are a certain number of places in each infected district, probably increasing in number yearly, which are actively infective and are the foci from which infection makes a fresh start, and if we could only definitely say where these localities are, we should be able to so attack them in the free season as to render them non-infective, and so prevent a fresh outbreak.

Large number of villages we know suffer a bad epidemic one year and escape entirely the next. What then are the factors that determine plague becoming endemic in certain spots, how and where is the infective agent, the plague bacillus, preserved through the period when the disease among man has apparently ceased? Investigations are being carried on in this direction, and I hope that soon we shall have more definite ideas on the subject.

Cannot Dr. Creighton, who remarks "Plague is a very ancient disease and, I take leave to say, very well known in its type and in its habits to those who are competent in such matters," enlighten us?

"The inclusion of plague, frankly and fully among the soil poisons," as Dr. Creighton did fourteen years ago, is certainly a summary way of disposing of the subject, but can hardly be called a scientific explanation of the subject or,

indeed, any explanation at all, any more than that miasmatic exhalation from the soil would be accepted nowadays as the final word in explanation of the incidence of malarial fevers.

Since plague started in this province, evacuation has been acknowledged to be one of the best measures for stopping any epidemic, unfortunately, it is a measure which cannot be enforced when we are dealing with millions of people, with the education of experience, however, it is becoming more and more popular and, in many districts, villages will readily evacuate even on the appearance of rat mortality, indeed, everywhere the people "intuitively perceive" that plague infection is intimately connected with the rat.

The rebuilding of the villages of India on new sites is the eminently practical advice we might expect to follow the enunciation of the views of the lecturer, one may only remark that in a country like Japan, or a town like Sydney, recourse was not made to such extreme measures, but the disease was stamped out by attacking, that link in the chain of infection which is the easiest to attack, the rat.

THE SIGNIFICANCE OF THE PYRIFORM CIRCULAR AND IRREGULAR SHAPED BODIES PRESENT IN THE CIRCULATION, ORGANS, OR TISSUES, IN VARIOUS FORMS OF DISEASE IN MAN AND ANIMALS, WITH SUGGESTIONS REGARDING THEIR IDENTIFICATION AND CLASSIFICATION

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For a number of years past, during a portion of the period of leisure at my command, I have studied the various phases in the life-history of trypanosomata met with in the circulation and organs of different animals, both in those which were suffering from diseases and others which exhibited no visible symptoms of ill-health. These trypanosomata include *T. Lewisii*, *T. Evansi*, *T. Equiperidum*, etc.

In addition, I have taken great interest in the accounts published of the trypanosomata and the immature forms which have been found in man. Although personally I have had but few opportunities of observing any of the latter forms in the fresh state or in stained specimens, it occurred to me that the results of my investigations in the lower animals might perhaps throw some light upon certain points which appear to be causing considerable discussion at the present time, with regard to the pyriform or globular forms which have been termed Donovan-Leishman bodies. These are found in small numbers in the peripheral circulation, and in greater numbers in blood obtained by splenic puncture from human beings, the subjects of enlarged spleen, and according to some, in Delhi sore.

It will only be necessary, in the present paper, to indicate as briefly as possible the various phases observed in trypanosomata, in the different stages in their life history, as observed during the course of disease in animals, explaining as far as possible the reasons for such manifestations, and later, by analogy compare the results obtained in the case of the lower animals with those observed in man, but it must be left to other observers in a better position to judge, how far, if at all,

such premises are compatible with the phenomena observed in the human subject

Equine Surra—As far as our present knowledge extends, Surra is an absolutely fatal disease in equines. No species of animals, except bovines and a small percentage of camels, in which the organism has been once observed in the blood microscopically, either in spontaneous cases or after subcutaneous inoculation, have recovered, unless we include a few treated with arsenic, mercury, etc.

In well marked cases of spontaneous and inoculated Surra (*Tryp Evansi*) in equines, camels and small animals, the disease is marked by two distinct periods, viz, paroxysms and intermissions. During the former periods mature trypanosomes are always present in the circulation, whereas during the latter, the mature flagellates are always absent. Further, in cases of long duration, the paroxysms are more prolonged at the commencement of the attack than they are towards its termination, and the intermissions gradually increase in duration as the disease advances, and towards the termination of the case, are longest in point of days. So that to take one example of a case which extended over 144 days, exhibiting 21 paroxysms and 20 intermissions, the first eleven paroxysms occupied 41 out of a total of 69 days, equal to 59.7 per cent while the last ten intermissions occupied 54 out of 75 days, equal to 72 per cent of the whole period. As a general rule it may be laid down that in equines the temperature is much higher during the paroxysms than during the intermissions. The temperature attains a maximum (which may register up to 41.6°C) generally when the greatest number of trypanosomes are present in the blood, but this condition is not constant. Paroxysms may terminate either by crisis when the temperature may, within half an hour fall suddenly several degrees and the hæmatozoa disappear as if by magic, although previously they were present in myriads, or more gradually by lysis in 12 to 48 hours. When the intermission intervenes, a normal or subnormal temperature is usually recorded.

Incubation period in small animals inoculated with blood drawn on successive days during a period of intermission—When a succession of guinea pigs or rabbits are injected subcutaneously with blood respectively drawn from equines suffering from Surra during periods of intermission, it will be found that the animals either do not contract the disease at all, or that the periods of incubation in the animals inoculated on different days vary in length considerably. We will take as an example one of a series of inoculations carried out in Poona (1,847 ft. elevation) in June 1894. An Australian horse, No 98, Intermission II, lasting four days. On each of the four days a guinea pig was subcutaneously injected with 0.30 c.c. of blood drawn from the jugular vein, and a like quantity was injected into a fifth guinea-pig, on the fifth day or first day of the third paroxysm to act as a control to the intermission blood. The 0.30 c.c. of blood injected into the No 1 guinea pig on the first day of the intermission failed to reproduce the disease. The period of incubation in the animal inoculated with the second day blood was 19.5 days, in the third 8.5 days and in the fourth 6.5 days whereas the animal inoculated with a like quantity of blood, on the fifth day or first day of the paroxysm succeeding the intermission exhibited the trypanosoma in its blood after an interval of five days, the usual length of the latent period observed in guinea pigs when inoculated with Surra material.

Presence of trypanosoma during paroxysms—In the majority of spontaneous cases of Surra in equines, the "causal agent" is carried by flies from a pre-existing case to the healthy animal, and the changes which take place at the seat of inoculation are identical with those which occur when the disease is conveyed to healthy animals by artificial means, i.e., by the subcutaneous injection of a minute quantity of Surra blood. The period of incubation in the inoculated animals varies according to the stage of the disease, when the injected blood

or body fluid used was drawn from the animal, and according to whether the trypanosoma was present in the mature or in the immature form. Before the disease becomes generalized throughout the body, certain changes take place at the seat of inoculation, which are accompanied by a varying amount of swelling, etc., which may be overlooked on account of its small dimensions. If specimens of blood or sero sanguinous fluid be removed and preparations be stained and examined microscopically daily, for a period of some days, no mature trypanosomes will probably be discovered, but small bodies pyriform, circular or of irregular conformation. Each cell presents two nuclei, a large open and granular form staining a bright red, and a small compact red dot lying in a matrix of protoplasm, which latter shows a blue colour after Romanowsky's method and its modifications. When once the trypanosoma appears in the blood of the general circulation of the affected animal, this demonstrates that the first day of the disease has arrived, i.e., the commencement of the first paroxysm. It frequently happens that but one trypanosoma can be discovered in two cover glass preparations on the first day, but the number of parasites increases rapidly day by day until it is not unusual to observe one hundred to one hundred and fifty flagellates in each field of the microscope (Leitz 7, oc IV). During the period of increase of organisms, not only are trypanosomes discovered in all stages of division, but numbers of circular, pyriform and irregular shaped bodies are concurrently present. They vary in size considerably from half the diameter of a red blood corpuscle to twice its dimensions. In spontaneous and inoculated Surra in equines one frequently observes, especially during the primary paroxysm of the disease, that the trypanosomes go on increasing in the circulation until enormous numbers are present and these persist from one to three days, at the same time the temperature of the animal rises, then suddenly the organisms disappear, the temperature falls several degrees (relapsing type), and no living mature trypanosomes can be discovered in the blood drawn from the peripheral circulation even upon the most careful examination of numerous specimens. This is a signal that the intermission has commenced.

Absence of the mature trypanosoma during intermissions—The periods of intermission at the commencement of an attack of typical equine Surra are short and rarely last more than two days, occasionally only one, but a succeeding paroxysm second to fifth may extend over four days. On the first day of this period it may be difficult or impossible to find a single pyriform or globular body even in several cover glass specimens of stained blood, but in an intermission lasting, for example, four days, the specimens of blood drawn on the successive days, will be found to be richer in the above mentioned immature forms, until at last a mature trypanosoma will be met with, and this indicates the first day of the succeeding paroxysm.

Cause of sudden disappearance of the trypanosomata from the circulation at the onset of the intermission—What process or change takes place in the blood of an animal the subject of Surra, which occurs sometimes suddenly and at others gradually, but which always brings about the same result, the disappearance of the mature trypanosomes from the circulation for varying periods?

(a) *Temperature*—The sudden disappearance cannot be due to hyperpyrexia for the following reasons—

(1) Only a very slight degree of elevation above the normal may be recorded during a paroxysm, nevertheless the trypanosomes may disappear suddenly by crisis.

(11) Hyperpyrexia and trypanosomes in vast numbers have been observed to exist concurrently for several hours in the same animal, yet the hæmatozoa persisted after the fall in body temperature. On the other hand, large numbers of parasites have been observed in an animal during many hours, yet the temperature recorded only ranged between 37.1 and 38.4°C. The presence of myriads of trypanosomes circulating through the ve-

sels of the brain appeared to have but little mechanical effect upon the heat centre of the animal

(iii) Before the death of a Surra animal, the trypanosomata have been observed to retain for several days, until death took place, full possession of their vitality, although a temperature above normal limits was maintained during the whole period

(iv) The great increase in the number of trypanosomata during a paroxysm may take place before the temperature begins to rise above normal limits, and may disappear from the circulation some hours before the maximum temperature has been reached

(v) A temperature between 40 and 41°C has been recorded at the commencement of a long paroxysm in an exceptional case when only one trypanosoma could be demonstrated in each field of the microscope, and yet the hæmatozoa went on increasing in the presence of the temperature

(vi) The minimum temperature of an intermission or apyrexial period, has been recorded on the first day of the succeeding paroxysm after the appearance of mature trypanosoma in the peripheral blood

(vii) Chickens inoculated subcutaneously with *Tryp Evansi* passed through the dog did not show any parasites in their circulation, until they had been kept in the cold and their temperatures reduced from 43° to 38.4°C on the fourth evening after inoculation. The trypanosomata were observed for the first time in the peripheral blood on the sixth day when morning temperatures of 42.7°C and 42.5°C were respectively recorded

(b) *Toxicity of Equine Surra blood* — Normal equine blood *per se* does not produce any detrimental effect when injected subcutaneously in large quantities in bovines. The subcutaneous injection of a bull (plains) with 4,000 c.c. of normal defibrinated blood from a healthy pony produced no serious symptoms, but 1,000 c.c. of defibrinated equine intermission blood withdrawn on the first day of the period and injected into a healthy plains bull produced within a period of fifteen minutes, great distress, troubled expression, salivation, œdema of eyelids, cyanotic condition of mucous membranes, abdominal pain, relaxation of anus, straining, fæces with mucus passed at short intervals. Animal continually lying down and getting up, pulse imperceptible. After a period of five hours, the pain still persisted, accompanied by shivering, extremities cold, respiration difficult and noisy, pulse still imperceptible. For several days this animal remained in a critical condition, although the most serious symptoms disappeared within twenty four hours

In a second animal, a plains bull, injected with 1,000 c.c. of defibrinated equine Surra blood, drawn from the jugular vein of a pony just before the termination of a paroxysm, produced symptoms similar to those described above, but in this case the animal succumbed within fifteen minutes

(c) *Anti-bacterial action of the serum, peritoneal and other body fluids* — If blood be drawn from a Surra equine on the first day of a paroxysm lasting, for instance, seven days in all, and the serum be collected therefrom, such serum when mixed with a small quantity of blood containing large numbers of trypanosomata obtained from the circulation of another Surra animal, will have no more effect upon the hæmatozoon than serum obtained from a healthy animal. If, however, blood be drawn from an equine on the last day of a paroxysm just before or at the time of the disappearance of the trypanosomata from the circulation and the serum allowed to separate in the dark, such serum will be found to have a powerful influence upon the trypanosomata of a second animal, or of the same horse during a succeeding paroxysm, especially if the organisms experimented with be obtained at the commencement of a paroxysm, when the blood of the second animal contains but a minimum of bactericidal power. One sample some days old and kept in the dark destroyed 95 per cent of the large number of trypanosomata present after an exposure of eighteen minutes,

while in the control specimen of blood, the organisms presented undiminished activity after several hours. The most mature forms of trypanosomata as evidenced by their size and development of the undulating membrane appear to be the first to be acted upon and succumb more readily than the less developed or younger parasites, which resist for a longer period the effects of the intermission serum. But whatever degree of bactericidal or trypanosomoidal power may be possessed by intermission blood at the time of its withdrawal from the circulation, it would appear to be almost entirely lost after exposure to the bright daylight during a period of twenty-four hours

No toxic substances excreted in the urine during early course of the disease in equines — Urine collected on the first and following days of an intermission in horses during the early portion of the course of Surra when subcutaneously injected into rabbits in doses of 20 to 50 c.c. produce no serious effects in the injected animals, or even when the dose is repeated subsequently within a few days

Quantity of Urea excreted during course of disease in Equines — The average daily output of urea in an Australian horse of some 1,100 lbs. body weight was during the period of health some 118.84 grammes, this amount increased by 27.45 grammes daily during the latent period, and rose to a daily total of 203.54 grammes during the paroxysms. In the intermissions which lasted but three and two days, respectively, it averaged 190.54 grammes. The average output for the 70 days during which the case lasted was 184.83 grammes, a quantity nearly the normal output of similar horses in England. Of this quantity 42.65 per cent was passed between 6 P.M. and 6 A.M., and 57.35 per cent during the remaining twelve hours

The hippuric acid gradually diminished from 25 grammes during the period of health, until during the first and second intermissions and third paroxysm none was excreted. Albumen appeared in large quantities during paroxysm III, when as much as 116 grammes daily were excreted, and this continued until death

Passage through series of animals increases the virulence of the Surra Trypanosoma — When Surra is passed through a series of equines resident either in the plains or in the hills, the virulence of the disease increases, as evidenced by a reduction in the duration of the disease

Further, there is a great tendency for Equine Surra to become modified when passed through a series of animals in the hills at an elevation of 7,500 ft., limits of variations in the shade temperature, maximum 86°F., and minimum, 19°F. The intermissions gradually decrease in length, so that but one paroxysm constitutes the course of the disease. The trypanosoma in a typical case is never absent from the blood of the peripheral circulation, although the number of organisms present at any one time vary considerably. This points to the fact that the bactericidal action of the serum of Surra (Equine) is much more powerful in animals resident in the plains, also that the course of the disease in the hills is shorter and therefore more virulent, and that the effort of Nature towards the natural cure by curtailing the length of the paroxysm, as is the case in the plains, is decreased or nearly absent

Bovines hyperimmunized with Equine Surra blood become possessors of powerful bactericidal sera — As previously stated, the serum collected from intermission blood drawn from an equine as soon as possible after the disappearance of the parasite from the peripheral circulation, when tested upon blood drawn from a second Surra animal at the commencement of a paroxysm containing numerous hæmatozoa, killed 95 per cent of the flagellates in a period of 18 minutes, although the control trypanosomata when mixed with normal horse serum exhibited undiminished activity after several hours

As early as 1894, I treated Equines (Surra) with intermission blood, and also hyperimmunized cattle with

Equine Surra blood drawn during both paroxysms and intermissions of the disease, but the curative effects of the respective sera were found insufficient, with regard to bringing about in the equines thus treated a cessation in the presence of the *T. Evansi*. More extensive experiments were made during 1897-1902, with the result that sera respectively obtained from several bovines previously hyperimmunized with defibrinated horse blood were found to possess the power of destroying vast numbers of trypanosomata after an exposure of two and a half minutes *in vitro*. Repeated doses of these sera injected subcutaneously into equines suffering from Surra were found to possess the power of destroying the mature flagellates present in the circulation of the host. But although they kept the disease in abeyance for a time apparently nevertheless in the end, these sera utterly failed to destroy the immature forms of the flagellates *in vivo* and the animals thus treated ultimately succumbed to Surra.

The cause of death in Surra—The course of Equine Surra in prolonged cases is marked by recurrent attacks of fever, rapid wasting and increasing weakness, appetite being usually unimpaired, no matter how high the temperature of the body. The host seldom or ever lies down in the later stages of the disease, for it has to eat night and day in order to preserve life and feed the hordes of parasites which prey upon its watery and impoverished blood. Progressive anaemia is present; the red corpuscles cease to form rouleaux, run together and form irregular masses, which later lose their colouring matter and become pale. To be more explicit in inoculated cases, the blood changes observed in Equine Surra include the following. The red corpuscles only increase in number during the period of incubation and during the remaining periods gradually decrease, concurrently the haemoglobin becomes greatly reduced in quantity, 40% and more of the amount in health. The number of white corpuscles decrease during the period of incubation, but during the first paroxysm they increase more gradually to nearly double the normal. The mononuclear corpuscles are in excess, and there is a great increase in the polynuclear forms. The eosinophile corpuscles become gradually reduced in number during the paroxysmal and periods of intermission until they are totally absent either shortly before or at the time of death. In cases of Surra treated with arsenic, a fair prognosis as to the patient's recovery from Surra, can be made by daily observations regarding the number of eosinophile corpuscles which decrease to zero, and in case of recovery, reappear and gradually increase until about the normal numbers are again recorded. Of 29 cases of Surra in equines, 23 succumbed within the first 30 days of the disease, and in 6, the course of the malady was prolonged from 31 to 87 days. In the great majority of Surra cases, death occurs during the course of a paroxysm, for example of 106, which succumbed, 92 or 86.80 per cent died during a paroxysm, while in the remaining 14 or 13.20 per cent death took place during an intermission. Death in Equine Surra may be—

(a) Sudden, in rare cases due to pulmonary embolism, but in the camel this form of sudden death is met with more frequently and may be due to either pulmonary embolism or cerebral complications respectively.

(b) In protracted cases to exhaustion and to marked changes in the blood and organs.

(1) Some animals retaining consciousness and continuing to eat until the last.

(2) Others become unconscious or completely comatose for several days previous to death, the haematozoa swarming during the whole of this period.

(c) In the intermediate form, the animal falls to the ground, death ensuing within 24 hours or less.

It is not at all uncommon to observe one or even two additional species of parasites invading the blood of equines, co-existent with that of the *T. Evansi*.

The two forms most frequently met with in equine disease in this pluvius are—

(1) *Filaria Embryos*,⁴ the larval forms of mature nematodes, which find a resting place in the aorta and large arteries of equines and camels.

(2) *Piroplasma Tropica*.⁵

Neither of these organisms when present singly or together appear to influence or endanger the life of the host to any great extent, unless the forms be present in overwhelming numbers, and then sudden death may occur during violent exertion.

The chief question of interest is, however, centered in whether one or more bacterial forms of organisms make their appearance during the course of this malady and bring about an intercurrent infection. Does a terminal infection take place in the majority of cases, and if so what organism or organisms are present? Numerous culture experiments have been carried out by me with blood (1) drawn at various periods during the course of Surra in equines, but especially from 72 hours to one hour previous to the occurrence of death, (2) from a few minutes to several hours *post mortem*. The results of these culture experiments clearly prove that with but very few exceptions the *T. Evansi* is the only organism present in the blood previous to the occurrence of death in cases of equine and camel Surra.

In one case in which a bacillus appeared, and was present concurrently with the *T. Evansi* during the middle course of the disease and up to the time of death the organism was found to be of the *B. coli* type. In pure culture when injected into a healthy pony in comparatively large quantity, it produced but a slight rise in the temperature from the normal, and no other symptom in the inoculated animal. Consequently one cannot be far wrong in assuming that the *T. Evansi* is the only causal agent in uncomplicated cases of equine trypanosomiasis, and by analogy that other forms of uncomplicated trypanosomiasis in man and animals most probably due to the respective forms of trypanosomata found in each form of disease respectively.

Camel—Spontaneous Surra in camels is very similar in all its stages to that observed in equines, the chief exception being that the disease in the former species is not always fatal, although only a very small percentage of animals recover, whereas in the latter it is an absolutely fatal disease. In Hindustan the disease is known by the name of Tibarsa, for it is recognized that if an animal survives the course of the malady during a period of three years, it will probably recover. The animals which succumb to spontaneous camel Surra, generally survive for longer periods than equines. For example, animals which have come under my close observation survived for nine and fourteen months respectively. A camel which was first attacked with Surra on 8th June 1901 still exhibited trypanosomata in small numbers, in its blood at long intervals up to April 1904. The paroxysms at the onset of the attack were frequent and persisted for some days, the intermissions being short. During the months November to April, 1902-03, the ratio of the length of intermissions to paroxysms was as 17.85 : 2, a year later the ratio was as 20 : 1.66, while during a period of 137 days, November to April, 1903-04, no organisms were discovered, although daily examinations of blood specimens were conducted, and a healthy pony which received 20 c.c. of blood subcutaneously from the same camel, failed to show any signs of Surra during a subsequent period of four months. The conditions under which the trypanosomata and the immature forms exhibit themselves during the periods of paroxysm and intermission are identical with those previously brought forward as occurring in equines. Further, rabbits inoculated with the camel trypanosomata, presented large numbers of immature forms, that is, pyriform, circular, and irregular forms in their blood during life, and in the liver, spleen and bone marrow at death.

Equines inoculated with small or large quantities of camel blood containing numbers of trypanosomes at the time of inoculation, pass through a prolonged course of the disease, marked by paroxysms and intermissions. Later the intermissions grow more and more prolonged until at last neither mature nor immature forms of the trypanosome can be discovered microscopically in stained specimens of blood, and healthy animals inoculated with equine blood do not contract the disease. Such equines as received the camel trypanosome when tested with the *T. Evansi* months later have been found to survive for 110 days, a much longer period than the control which survived only 19 days, but whether animals so treated will ultimately recover remains to be proved. Camels inoculated with *T. Evansi* direct from equines, readily succumb according to the amount of blood they receive. One animal three years old inoculated subcutaneously with 20 c.c. from a Surra pony succumbed in nine days, while a second camel which received 1 c.c. of blood from a similar source to the last, passed through a period of incubation lasting twelve days and succumbed 42 days later. During the course of the disease, in the latter animal, four paroxysms lasting 35 days, and three intermissions occupying a period of seven days intervened.

Bovines—Equine Surra when inoculated into bovines produces a marked form of modified Surra,⁷ but it is seldom or ever fatal. Although the spontaneous trypanosomiasis of cattle,⁸ due to the presence of a different species of flagellate may bring about death. Buffaloes⁹ on the contrary always succumb to inoculated equine Surra.

The *T. Evansi* subcutaneously inoculated into plains bovines frequently produces but one severe paroxysm during which period the parasites may be present in vast numbers, and then the trypanosome appears only at intervals, sometimes prolonged. Although the mature organism may not have been observed for over 100 days in specimens of blood drawn for examination, nevertheless small animals inoculated with blood drawn direct from the jugular vein have developed the trypanosome after varying periods of incubation, and the disease in such cases is reproduced in the absence of the mature trypanosome, but the pyriform, circular or irregular shaped bodies (termed immature forms) are always present but in varying numbers.

It will be remembered that the length of the intermissions in the same animal always vary considerably during the course of the first and second halves of the disease. Thus the mean of a number of intermissions in donkeys gives 2.5 days as the duration of the periods during the first half, and 10.7 days for the last half. It is, however, impossible to imagine that the cycle of development of the immature to mature forms of trypanosomes requires a period of four times as long to bring about the same changes, during intermissions which occur during the latter portion of the disease, as that occupied during the earlier, unless the immature forms of the parasite be influenced by the presence of some body or bodies in the blood, which produce inhibitory effects upon its development.

The anti-body or bodies which must be present in the blood of a Surra animal at the crisis of the first paroxysm, would, therefore, appear to be readily lost, or eliminated from the system during the early days of the disease, for the cycle of development of the resting or immature forms of the trypanosome only occupy as a rule 24 to 48 hours. Before the organisms disappear by crisis at the termination of the first paroxysm, it is usual for the trypanosome to be present in myriads in the circulation for from 24 to 72 hours, while during subsequent paroxysms the flagellates may, as frequently happens, never again attain to such numbers. The explanation of this appears to be that the blood of the animal at first more or less free from the influence or presence of the anti-bodies becomes, as the course

of the disease progresses, influenced by the presence of the bio-chemical products, and, therefore, a smaller number of parasites are able to manufacture the deficit between the amount retained in the system and the required percentage of material necessary to destroy the organisms, and thus bring about the same result, an intermission, instead of requiring the co-operation of myriads of hæmatozoa as at the close of the first paroxysm. As a necessary corollary it would follow that the development of the trypanosome is more or less influenced by a definite percentage of anti-body present in the serum, and until a certain and perhaps definite decrease in the quantity of the anti-body takes place during an intermission, the further development of immature to mature forms of trypanosome is held in check, so that the length of an intermission may be primarily due to the amount of anti-body or bodies present, and the time which is required for the reduction or elimination of a certain percentage of these bodies.

Conversely, the length of a paroxysm would appear mainly to depend upon the rapidity or otherwise of the trypanosome (present in the circulation of the host) to elaborate the required percentage of the anti-body or bodies which bring about their own destruction.

Dourine (*T. Equiperdum*)—A disease of equines generally contracted during covering. The trypanosome gains access to the general circulation through the genital passages either through an abrasion of the mucous membrane, but probably also through the intact tissues. Although the *T. Equiperdum*¹⁰ and its immature forms are frequently met with in the blood of the general circulation, it is more easily studied and in much greater numbers, in the blood and sero sanguinous fluid derived from the cutaneous manifestations. The chief points of interest to be noticed here are that the pear shaped, oval, circular, and irregular shaped immature forms of the trypanosome are all met with in large numbers in the blood of the cutaneous plaques at certain times, and that in some cases these forms are also to be observed in the blood examined, when collected on the first day of the manifestations. These forms, however become much more numerous, when the plaque has persisted for some days, and a time arrives when only the immature forms are to be found in fair numbers, the mature flagellates having succumbed and undergone a granular change. The protoplasm of their bodies disappear occasionally, leaving in stained specimens, outlines of the undulating membranes, but more frequently only the nutritive nucleus and blepharoplast divided by a short interval. It is conjectured that on the resolution of the cutaneous plaques all the immature forms are released from the circumscribed cutaneous affected area and when freed return to the general circulation.

The blood or sero sanguinous fluid taken from within a plaque is bactericidal *in vitro*, at the time of the disappearance of the mature forms of the trypanosome and during the interval before the plaque becomes resolved.

The so-called Donovan Leishmann bodies as met with in the circulation and tissues of human beings in India—The parasites as met with in human beings suffering from enlargement of spleen in India are described as exhibiting certain characteristics. "Forms included in a substance which they took to be the body of a red blood corpuscle, changed by the presence of the parasite. In addition to circular forms they found bodies which were distinctly pear shaped, and this appeared to be the most typical form of the parasite."¹¹

Following the researches of Rogers,¹² these bodies develop into flagellated organisms, which do not exhibit undulating membranes, at all events in the different stages that have come under his notice up to the present.

If we compare the different forms assumed by these bodies, with the characteristics exhibited by such immature forms in trypanosomiasis in animals, *T. Evansi*, *T. Lewisi*, etc. and *Herpetomonas* certain distinctions will be apparent.

The prominent characteristics exhibited by the pyriform bodies or immature forms of certain Protozoa, as met with respectively in animals, man and some Diptera

Prominent characteristics of the pear-shaped and circular bodies	TRYPANOSOMATA OF ANIMALS.				HUMAN FORMS		UNNAMED FROM DIPTERA	HERPETOMONAS	
	Evans.	Equi peridum	Lewis	Brucel.	Spleen Cases	Delhi Sore	Flagellum terminating in knob	Musco domestico	Sarcophagro
Forms of cells	Circular, oval, pyriform, irregular	Circular, oval, pyriform, pointed at one or both extremities	Oval, pyriform and round	Circular, oval, pyriform, irregular	Circular, pear shaped and irregularly oval occasionally points at one end, distinct cuticle	Oval, round and spindle form. Apparently definite capsule to cell	Pyriform, oval	Pyriform, circular	Pyriform principally
Macro or nutritive nucleus	Circular, oval, open granular large nuclei	Circular, large granular	Circular, occasionally oval	Circular, oval, open granular large nuclei	Circular, oval or pyriform, heart-shaped when undergoing division	More or less circular, nearly centrally placed, always touching one edge of cell	Circular, large open, granular situated centrally or at one edge	Circular, oval, open, granular, touching edge of cell	Circular, large, open, granular, touching edge of cell
Micro nucleus or blepharoplast.	Circular dot, dumb-bell when undergoing division, often surrounded by halo. Division form seldom seen in peripheral circulation	Circular dot, dumb-bell when undergoing division, often surrounded by halo or vacuole. Division forms seldom observed in peripheral circulation	Circular dot, dumb-bell form when undergoing division, halo, frequently surrounding nucleus. Division form seldom observed in peripheral circulation	Circular dot, dumb-bell when undergoing division, often surrounded by halo. Division forms seldom seen in peripheral circulation	Usually rod shaped may appear as a dot only. One or two vacuoles seen in peripheral circulation	Varies from a dot to a long thick rod, a vacuole not usually seen at all in blood peripheral circulation	Circular dot, develops into a rod	Rod shaped generally, occasionally circular, trilobed, kidney-shaped	Circular dot, develops into a rod
Divisional form	Either with two nutritive nuclei or with two flagellate nuclei	Occasional division forms	Observed	Occasional division forms	Frequently observed	Observed	Observed	Not observed	Not observed
Presence in the blood peripheral circulation	Observed always	Observed in places, occasionally in the general circulation	Observed	Observed	Observed general disease	Not observed in blood (peripheral), but enlarged gland in neighbourhood of sore		"	
Position of flagellum in rosette formation	Periphery, blepharoplast at centre	Periphery, blepharoplast at centre	Periphery, blepharoplast at centre.	Periphery, blepharoplast at centre	Centrally, with blepharoplast at periphery	Centrally, with blepharoplast at periphery	Centrally but with blepharoplast at periphery	Centrally with blepharoplast attached to rhizoplast	Centrally with blepharoplast attached to rhizoplast
Number of individual parasitic sites in a rosette or in spheroidal forms	13 to 16 Majority at 13 (Langford)	10 observed. (Langford)	10 to 16 (L. Rabinowitsch)	2 to 8 elements (Plummea & Bradford)	Up to 10 or more (Christophers)	19 to 34 (James)	16 observed (Lindsay & Jennings)	Up to 20 or more (Prowazek)	16 observed (Prowazek)

(To be continued)

A Mirror of Hospital Practice

A SERIES OF SIXTY-FIVE CASES OF STRANGULATED HERNIÆ

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So much has been written about herniæ when they become strangulated that it may appear to be a work of supererogation to write more, but the operation has a certain fascination, for one can never be absolutely sure until the sac is

opened whether it will be necessary to perform a resection or not, in a minor degree too the conditions found vary widely. These varying features add what may be called a sporting element, which is lacking in the performance of many routine operations. Certain differences have also been found in the strangulated herniæ of Indian patients as compared with European and it is the main object of the paper to point these out. Of the cases in the following table seventeen were performed in London, the remainder in India. The small number of femoral and ventral herniæ, although operated on before the Indian cases are placed at the end of the list. Inguinal herniæ are arranged according to the date of operation.

INGUINAL HERNIA

No	Race	Sex	Age	Side	Duration of Hernia	Duration of Strangulation	Contents of Sac	Treatment	Result	REMARKS
1	English	M	59	R	3 wks	6 hrs	Small gut	Sac ablated with silk Pillars sewn with goldbeater's skin	C	Fluid in tissues outside sac. Gut slightly congested. Scrotal hernia.
2	English	M	45	R	4 yrs	24 hrs	Cæcum, appendix and three large coils of gut, much distended	Herniotomy and reduction	D	Canal slit up, difficulty in reduction of gut. Death from shock. P. M. Lower 6ft of ileum dark plum colour but recoverable, blood in gut. Cæcum and appendix also congested. Liver cirrhotic. Lungs oedematous.
3	English	F	72	R	2 yrs	2 days	Small gut, omentum	Gut replaced. Omentum and sac ablated with silk. Pillars sewn with silk.	C	Small gut congested. Omentum closely adherent to sac.
4	English	M	62	R.			Omentum	Omentum ablated with silk. Sac ligatured with silk and ablated. Macewen's stitch with kangaroo tendon.	C	Large mass of omentum. Diarrhoea after operation.
5	English	M	37	R	20 yrs	6 hrs	Small gut, slightly congested	Sac ablated with silk. Macewen's stitch with kangaroo tendon.	D	Sudden death 17 days after operation. P. M. Seat of strangulation 12" above cæcum. Pleura adherent. Cause of death not found probably inguina pectoris. Syncopal attack before death.
6	English	M	25	R	1 wk	1 wk	Small gut, gangrenous	Herniotomy and enterotomy tube introduced into gut.	D	Congenital hernia 4" of gut gangrenous and perforated. Fæces did not escape until after herniotomy. Sudden death on 6th day. P. M. Artificial anus 1ft from cæcum, local peritonitis.
7	English	M		R	8 yrs	10 hrs	Small gut	Gut replaced. Sac ablated with silk. Macewen's stitch with kangaroo tendon.	C	Violent taxis by patient. Knuckle of small gut much bruised and mesentery infiltrated causing difficulty in reduction.
8	English	M	19	R	15 hrs	15 hrs	Congested small gut.	Gut replaced. Sac ablated with silk. Macewen's stitch with silkworm gut.	C	Congenital hernia. Constriction at both int. and ext. rings. Fluid in sac.
9	English	M	1½	R.	6 mos	24 hrs	Cæcum and appendix	Gut replaced. Sac ablated with silk. Macewen's stitch with silkworm gut.	C	Funicular hernia.

INGUINAL HERNIA —(Continued)

No	Race	Sex	Age	Side	Duration of Hernia	Duration of Strangulation	Contents of Sac	Treatment	Result	REMARKS
10	English	M	46	R	12 yrs	7 hrs	Congested small gut, constriction rings	Gut replaced, canal slit up and sutured with silk worm gut.	C	Congenital hernia
11	English	M	29	R	3 yrs	3 days	Deeply congested small gut with lymph constriction rings	Gut replaced, sac ablated with silk Macewen's stitch with kangaroo tendon	D	Belly distended, abdominal furies Death in few hours P M Intestines distended and injected Pa renchymatous nephritis
12	English	M	3 wks.	R.	3 wks	6 days	Deeply congested small gut	Gut replaced, canal slit up	D	Symptoms persisted Death 2nd day P M 6" of ileum and small portion of caecum still strangulated in sac between ext. and int oblique
13	English	M	37	R.	9 yrs	12 hrs	Caecum, portion to outer side of anterior longitudinal band gangrenous	Herniotomy and enterotomy drainage tube into ileum	C	Later plastic operation for cure of faecal fistula Portion of faeces passed per rectum shortly after operation
14	English	M	37	R	32 yrs	2 days	Omentum	Omentum ablated with silk Sac ablated with S W gut. Macewen's stitch with kangaroo tendon	C	Congenital sac
15	Brahmin, Central India	M	60	R	12 days	12 days	Colon, gangrenous.	Enterotomy	D	Large amount of gangrenous gut.
16	Gujar, Central India	M	40	R.	10 yrs	4 days	Caecum, appendix and colon	Herniotomy and enterotomy	D	Recent lymph on surface of gut which was very thickened and doubtful, patch of gangrene in caecum Ext ring very tight, sudden collapse, and death 2nd day
17	Bengali, Hindu	M	50	R	5½ yrs	44 hrs	Omentum, colon and loop of small gut.	Omentum and sac ablated with catgut. Pillars sewn	C	Gut purple and ecchymosed Ring large
18	Bengali, Hindu	M	46	R	4½ yrs	12½ hrs	Caecum and about 10" of ileum	Gut replaced Sac ablated with catgut. Ring sewn with catgut	C	Semi solid faeces in ileum, difficulty in reduction of gut unsatisfactory R. O., recurrence in 4 months bronchitic subject
19	Bengali, Hindu	M	22	R.	22 yrs	6 hrs	Caecum and 8-10" of ileum, purple	Gut replaced Ablation of sac with catgut. Canal sewn with catgut.	C	Stricture at neck of sac, ext ring also tight. Fluid in sac
20	Bengali Mussulman	M	55	R	4 yrs	7 days	Oecum below ileo-caecal valve strangulated	Sac ablated with silk One Macewen's stitch and subcuticular suture with silk	C	Much lymph in sac, hemorrhage into gut wall previous taxis and purgation Onset of symptoms gradual
21	Bengali, Hindu	M	50	R	20 yrs	6 hrs	About 2ft of congested small gut.	Ablation of sac with silk One Macewen's stitch with silk	C	Respiratory failure from CHCl ₃ Distension of belly relieved by mag sulph and enema
22	Parsee	M	19	L	10 yrs	15 hrs	Omentum	Sac ablated and also omentum with catgut. Canal sewn with catgut.	C	Distension of belly relieved by mag sulph and enema
23	Bengali, Hindu	M	16	R	1 yr	7 hrs	Small loop of small gut, purple	Ablation of sac and varicocele with catgut. Ext. oblique incised Macewen's stitch with silk.	C	Little lymph on gut
24	Bengali, Hindu	M	42	R.	2 yrs	4 days	Caecum and terminal portion of ileum	Excision of gangrenous area, suture of all layers and superimposed layer of Lembert sutures Gut reduced	C	Caecum deeply congested with patch (linear) of gangrene on anterior surface Constriction divided and gut pulled down Gauze drain to replace gut removed 2nd day Little distension of belly 1st day

INGUINAL HERNIA — (Continued)

No	Race	Sex	Age	Side	Duration of Hernia	Duration of Strangulation	Contents of Sac	Treatment	Result	REMARKS
25	Bengali Hindu	M	1½	R	4 mos	6 days	Large hernia, contained colon	Gut replaced Canal slit up Sac ablated with silk Silk sutures to canal	C	Funicular Reduction difficult
26	Bengali Hindu	M	45	R	25 yrs	14½ hrs	7 ft congested small gut. Mesentery thickened	Canal slit up Gut replaced Sac ablated with silk Canal sewn with silk	C	Turbid fluid sac Difficulty in reduction Distension of belly for several days, relieved by mag sulph and enemata
27	Bengali Hindu	M	45	R	13 yrs	7 hrs	Cæcum and 3 ft of ileum	Canal slit up Gut replaced Sac ablated with silk Silk and S W gut sutures to canal	C	Ice and taxis before admission About 1 ft. of ileum much infiltrated with blood Bloody stool after operation, little distension later
28	Bengali Hindu	M	29	L	1½ yrs	5 hrs	One foot of slightly congested small gut.	Gut replaced Ablation of sac with silk Macewen's stitch and subsidiary one with silk	C	Stricture not divided
29	Bengali Hindu	M	28	L	2 mos	6½ hrs	2 ft. congested small gut	Gut replaced Sac ablated with silk Canal sewn with silk	C	Mesentery swollen, causing difficulty in reduction One bloody stool after operation
30	Eurasian	M	1 yr	R	1 yr	19 hrs	Cæcum, appendix and 5-6" of small gut	Canal widely slit up Suture of peritoneum after ablation of sac with S W gut Bassini with S W gut	C	Difficulty in reduction
31	Bengali Hindu	M	6	L	2 yrs	2 days	6" of purple small gut.	Ring divided Gut replaced ablation of sac with silk. Macewen's stitch and others with S W gut.	C	Constriction rings Fluid in sac Belly distended Congenital hernia Distension relieved by mag sulph and enemata
32	Bengali Mussulman	M	45	L	20 yrs	6 hrs	8-10 ft. of slightly congested small gut.	Canal slit up Peritoneum sutured with S W gut One Macewen and subsidiary silk stitches to canal	C	Difficulty in reduction, large amount of fat in mesentery Stitch sinus Truss
33	Bengali Hindu	M	30	L	1 year	9 hrs	Contents of sac small loop of congested small gut.	Ext ring divided Gut replaced ablation of sac Macewen's stitch Silk used Exc of hydrocele sac	C	One appearance of hernia a year before
34	Bengali Hindu	M	65	L	10 yrs	20 hrs	3 loops of purple small gut matted together	Ext ring divided, adhesions of gut partially separated Gut replaced Sac ablated Macewen and subsidiary stitches with silk	C	Pendulous intraperitoneal lipoma at neck of sac also removed Stitch sinus
35	Bengali Mussulman	M	50	L	8 yrs	8 hrs	Many coils of small gut half of which were matted together	Canal slit up Gut replaced Sac ablated Macewen and subsidiary stitches Silk used	C	Great difficulty in reduction Stitch sinus
36	Bengali Hindu	M	45	R	1 year	5 hrs	2½ ft. of small gut	Gut replaced Sac ablated Peritoneum sewn with S W gut Macewen's stitch and subsidiary sutures with silk	C	Scrotal elephantiasis Very big ring
37	Bengali Mussulman	M	70	R	12 yrs	4 days	Cæcum, appendix and about a foot of colon	Ext oblique slit up, Sac ablated One Macewen and subsidiary stitch with silk Ext oblique sewn with S W gut	C	Slow strangulation Gut œdematous Mesentery bruised Stitch sinus

INGUINAL HERNIA —(Continued)

No	Race	Sex	Age	Side	Duration of Hernia	Duration of Strangulation	Contents of Sac	Treatment	Result	REMARKS
38	Bengali Hindu	M	45	R	2 yrs	13 hrs	Cæcum and appendix	Canal slit up Basini with silkworm gut Gut replaced	D	Much distension of cæcum ascitic fluid in belly Colon greatly distended during night interference with heart action Was not sent for until patient pulseless died from lack of an enema
39	Bengali, Hindu	M	58	R.	5½ yrs	17 hrs	6" of deeply congested colon	Gut replaced Sac ablated Macewen's stitch with silk	C	Bloody fluid in sac. Very tight ext ring Veins of cord varicose in places forming globular masses size of Barcelona nut
40	Bengali Hindu	M	30	R	2 yrs	9½ hrs	12" of œdematous small gut	Gut replaced Sac ablated Macewen's stitch with silk and secondary stitch with S W gut	C	Congenital Imperfect septum in sac above testis
41	Bengali, Hindu	M	19	R	2 mos	16 hrs	6" of small gut purple, constriction rings	Gut replaced Sac ablated, Macewen and other stitches with S W gut Varicocele excised	C	Funicular Tight ext ring and also band at neck of sac
42	Bengali, Mussulman	M	35	R		6 hrs	3 4 ft deeply congested small gut Well marked constriction rings	Canal slit up Gut reduced Sac ablated Macewen and subsidiary stitches Silk and S W gut used	D	Congenital Extremo shock on admission Haemorrhage inside gut and in wall Recovered from shock Offensive bloody stools and hæmatemesis Vomiting and hiccough persisted Bowels open several times Belly did not distend Death 4th day
43	Bengali Hindu	M	67	L	25 yrs	6 hrs	Many coils small gut.	Gut replaced, upper part of sac ablated Macewen and other stitches with silk	C	Stricture ext ring, which was very large
44	Bengali Mussulman	M	35	R	2 yrs	3 hrs	2½ ft of small gut with separate loop 9" in front strangulated	Gut replaced Canal slit up Sac ablated Macewen and other stitches Silk and S W gut used Hydrocele tapped	C	Thick mesentory causing difficulty in reduction
45	Bengali Hindu	M	32	R	9 mos	36 hrs	Small gut	Cœlotomy	D	Reduction en masse, <i>vide infra</i> .
46	Bengali, Hindu	M	30	R.	10 12 yrs	23 hrs	Two loops of slate coloured small gut Omentum	Omentum ablated Gut replaced Sac ablated Macewen and subsidiary stitches Silk and S W gut used	D	Patient restless shortly after op Pulse feeble Abdominal pain Later vomited coffee ground material Death in 20 hours No P M cause of death
47	Bengali, Hindu	M	47	R	2 yrs	9 hrs	Omentum	Omentum and sac ablated Macewen's stitch with silk	D	Fat and flabby subject Micturated into dressings Acute sepsis Local cellulitis
48	Bengali, Hindu	M	55	L	6 mos	2½ hrs	One loop of small gut 4" in front of 2nd about 8"	Gut replaced Sac ablated Macewen and other stitch to canal Silk and S W gut	C	Stricture ext ring
49	Bengali, Hindu	M	35	R	2 yrs	9 hrs	Congested small loop of small gut Omentum	Gut replaced Sac ablated Macewen's stitch with silk and secondary with S W gut Omentum ablated	C	Taxis outside Haemorrhage in gut wall and bloody fluid in sac Stricture ext ring

INGUINAL HERNIA —(Continued)

No	Race	Sex	Age	Side	Duration of Hernia	Duration of Strangulation	Contents of Sac	Treatment	Result	REMARKS
50	Jow	M	55	L	2 yrs	17 hrs	Large mass of omentum with loop of small gut in midst, dark red and with roughened surface	Gut replaced Omentum closely adherent to sac ligatured and ablated upon sac about 1½ lbs Canal slit up Peritoneum sewn with silkworm gut. Macewen and secondary sutures of silk Ext oblique with S W gut	O	Hydrocele of hernial sac Stitch sinus
51	Bengali, Hindu	M	30	R	6 mos	5 hrs	Vein deeply congested small gut Omentum	Gut replaced Omentum and sac ablated Macewen and subsidiary stitches	O	Gut necked in incision double continuous suture Congenital sac, attempt at formation of tunica vaginalis Very tight constriction at int ring
2	Mussulman	M	40	L	12 yrs	14 hrs	2 ft congested small gut.	Gut replaced Sac ablated, Macewen and secondary stitches Silk and S W gut	O	Hard nodules in mesentery close to gut Stitch sinus
53	Bengali, Hindu	M	82	R	26 yrs	3½ hrs	2 ft. small gut, caecum adherent to neck of sac	Sac ablated, caecum wounded, double continuous silk suture, replaced with portion of sac. Canal sewn with S W gut.	C	Cocaine anaesthesia Previous strangulation and herniotomy by McLeod 10 15 yrs previously
54	Mussulman	M	50	L	1 yr	7½ hrs	3 large loops of small gut	Gut replaced Sac ablated, Macewen and subsidiary sutures Silk S W gut	C	Ice and taxis outside Gut on opening sac still cold from the ice Bloody stools for two days Stitch sinus 14th day
55	Bengali, Hindu	M	62	L	7-8 yrs	28 hrs	Omentum and 3 ft of small gut	Omentum ablated Gut replaced Sac ablated Macewen and subsidiary sutures	C	Hæmorrhage in wall of gut, mesentery oedematous and much fluid in sac Peculiar pocket in sac, apparently imitating infantile type Blend from glaucoma, atheroma and chronic bronchitis
56	Bengali, Hindu	M	61	L	7 yrs	6½ hrs	2 ft. of congested small gut.	Gut replaced Sac ablated Macewen and other stitches Silk and S W gut.	C	Much fluid in sac Little distension 2nd day
57	Bengali, Hindu	M	42	R	1 mo	7 hrs	Cæcum, appendix 3" of colon and 8" of ileum	Gut replaced Sac ablated Macewen and subsidiary sutures Silk and S W gut	O	Ice and taxis under HCl, outside Bloody fluid in sac Cæcum very moveable, apparently meso cæcum
58	Bengali, Hindu	M	35	L	12 yrs	15 hrs	8" of purple small gut omentum	Omentum and sac ablated Macewen's and subsidiary stitches Catgut.	C	Congenital hernia, constriction by peritoneal ring at site of int ring, difficulty in division
59	Bengali, Mussulman	M	30	R	8 days	8 days	Loop of gangrenous gut	Enterotomy	D	Scrotum gangrenous Abdomen distended Improved Sudden death 6th day, heart failure No undigested food from artificial anus
60	Bengali, Hindu	M	50	R	2 yrs	5 hrs	Cæcum 4" of ileum	Gut replaced Macewen and subsidiary sutures Xylol catgut. Radical cure of double hydrocele	O	Blood stained fluid in sac.

INGUINAL HERNIA —(Concluded)

No	Race	Sex	Age	Side	Duration of Hernia	Duration of Strangulation	Contents of Sac.	Treatment	Result	REMARKS
61	Bengali, Hindu	M	20	R.	5 days	5 days	Small gut 1"	Cœliotomy	C	Reduction en masse, vide infra
FEMORAL HERNIA										
62	English	M	48	R	3 yrs	9 hrs	Small gut and omentum	Omentum ablated Gut replaced Macewen's treatment of sac	C	Small gut purple
63	English	F	54	L	7 yrs	3 days	Small gut and omentum	Omentum adherent to sac ablated Gut replaced Sac twisted, ligatured and ablated	C	Small gut purple, well marked constriction rings
64	English	F	50	R.	1 year	24 hrs	Loop of small gut	Herniotomy and reduction	C	Gut purple and doubtful, replaced and gauze drain to loop, difficulty in reduction Gimbernat's completely and Poupart's ligament partially divided
VENTRAL HERNIA.										
65	English	F	60	—	20 yrs	60 hrs	Loop of small gut 2½" gangrenous Omentum	Omentum ablated Resection 5" of gut anastomosis with Murphy's button Exploration and enterotomy 2nd day	D	Symptoms abated after op 2nd day required Exploration showed resected gut immediately beneath incision, surrounded by adhesions Button had sloughed through gut wall in two places, no extravasation Abdomen irrigated Death 3rd day P M Anus 3ft. from cæcum, gut distended with thin flakes of scattered lymph

On examination of the list, one notices the large number of cases of inguinal herniæ in which the cæcum formed part of the contents of the sac, thus out of 14 English cases it was present in 4, i.e., 28.5%

The small number of cases makes this of little value and is probably merely a coincidence, for out of a series¹ of 105 cases of strangulated inguinal herniæ the cæcum was present eight times making a total of 7.6% (My cases were included in this series)

In the Indian series, however, it was present twelve times in a total of 47 cases = 25.5%. This number, though small, is perhaps sufficient to enable one to say that cæcal herniæ are more frequent in India than in England

The records of cases to which I had access were much too inaccurate to be of any value, otherwise a long series of Indian cases would prove the point

Brunner² out of 417 cases of herniotomy found the cæcum present in 28%, and Bull³ while stating that cæcal herniæ are more frequent than usually supposed, found the cæcum 31 times out of 865 cases = 3.7%

The causation of this frequency has to be considered, or rather since the cæcum must be

freely movable (except in the case of very large hernia) to permit of its entering the sac of a hernia, the causation of the mobility of this organ Tieves⁴ out of 100 bodies found 11 cæca that could be made to touch the under-surface of the liver and any part of the left side of the pelvis, and in some of the specimens the cæcum might well have occupied a left inguinal or femoral hernia

The mobility of the cæcum depends in the main upon two conditions, first, the length of intestine which extends between the tip of the cæcum and the reflection of the peritoneum, and secondly, upon the presence of an ascending meso-colon. The former factor is of the greater moment

To decide whether the cæcum was more mobile in natives of India 120 bodies were examined. For the vast majority of these observations I am indebted to Major Vaughan, I.M.S., and Captain Leonard Rogers, I.M.S. There was no selection of cases except that those dying with marked intestinal lesions were excluded. Major Vaughan's cases were of sudden death examined in the course of his duties as Police Surgeon of Calcutta, so that the specimens may fairly be considered as average

In this series 79 were Hindus, 37 Mahomedans, and 4 Native Christians, 85 males and 35 females. The ages varied between 11—80 years, the average being 35.

Dividing this series into three classes, we have *Class A*. In 73 specimens the cæcum was fixed, *i.e.*, it could not have formed part of the contents of a hernia.

Class B. In 26 it was movable, that is, the organ could have entered the sac of a right inguinal hernia.

Class C. In 21 cases it was very movable.

Considering only the last class of case we find a percentage of 17.5 as compared with Treves' 11%; so that we can conclude that given a right inguinal hernial sac, the cæcum is more likely to enter it in Indians than in Europeans.

In some of these cases where the cæcum was very movable the cause was congenital, *i.e.*, the foetal condition of the organ persisting into adult life. On the other hand, may there not be an acquired factor?

The native of India is practically a vegetarian, and his food leaves a large amount of intestinal debris, the bulk of his faeces being much greater than that of the European, this can be easily observed by passing the outskirts of any Indian village. Moreover, Buchanan⁵ has made exact observations on this point, and states that the average weight of the solid excreta of a European is 4 ozs, while that of the native of India is at least 8 ozs.

This additional weight and bulk will tend to elongate the cæcum when the subject is in the erect position, and may possibly, during the course of years, drag down the peritoneal attachment of the organ similarly to what occurs in large old standing herniæ.

Many of the cases of cæcal herniæ in the above table were of advanced age.

Macewen,⁶ too, has recently drawn attention to the amount of digestion which goes on in the cæcum, and quotes cases of his own showing the disturbance of digestion which occurs either when a cæcal colotomy is performed, or when that organ is totally removed. Referring also to comparative anatomy, he shows that in carnivorous birds and animals, digestion takes place chiefly in the upper part of the digestive tract, the cæca being small while in the herbivora it is enormous.

Comparing the European with the Indian, the latter is much more of an herbivorous animal than the former, and we should therefore expect the latter's cæcum to be better developed, larger and more likely to be present in a hernia when one exists.

The above conditions may possibly account for the frequency of cæcal herniæ, at any rate they are factors worthy of consideration. It will be seen that no example of congenital cæcal hernia occurs in the above series.

Some of the above cases are worth describing in more detail.

Case No 45. The patient had had a hernia for nine months thirty-six hours before admission, he had either replaced the hernia, or it had suddenly slipped up. A different history could easily be elicited from time to time.

He had suffered from pain in the belly, constipation and vomiting. On admission he was in good condition and walked into the hospital. The right inguinal ring was possibly a little larger than the left but nothing could be felt. There was an impulse on coughing and he had fever. An enema was given and produced a small stool, he vomited once that day. The condition in the evening was the same except that the abdominal pain was less. On the 2nd day the condition was the same, another enema had been given producing a small stool and the belly was not distended. In the evening there was a little distension and he had vomited twice, a third enema produced a small stool. On the 3rd day his condition had changed markedly for the worse, the belly was distended and abdominal tenderness was present. The fever had persisted since admission. Coeliotomy was performed through the right rectus something extremely like an intersusception presented, a coil of distended and congested small gut entering what appeared to be a whitish scarred looking cæcum. The small intestine was pulled upon and the two portions at once separated, it was then found that what had previously appeared to be the cæcum was the invaginated sac, the extremity of which had risen into the abdomen for 1½ in. The arrangement was exactly similar to that which sometimes occurs in stripping off the fingers of a glove, in which the greater portion of the length of a finger has been turned inside out while the terminal portion retains its normal position in regard to the finger of the hand. In this portion the loop of gut remained strangulated. The sac was transfixed below ligatured and removed. The intestines were slightly distended but appeared recoverable. The operation lasted 15 minutes. The pulse and respiration rate ran up and he died in 24 hours.

Case No 61 was very similar. He was admitted as a case of intestinal obstruction and operation performed, later the following history was obtained by dint of much careful questioning. The hernia had first appeared five days before admission with all the symptoms of strangulation, he was attended by a native practitioner who diagnosed hydrocele, he prescribed a liniment with which he himself rubbed the swelling and the patient later vigorously followed his example, the swelling was slowly reduced on the 2nd day. The symptoms persisted, and on admission on the 5th day he presented the typical appearance of a case of intestinal obstruction. Coeliotomy was performed through the right rectus, a distended

coil of intestine presented which was traced downwards to the neighbourhood of the internal ring where a band was felt, the incision being enlarged downwards a condition was found almost exactly similar to the preceding case with the exception that the invagination of the "finger of the glove" was not symmetrical being longer on the outer side. About one inch of small gut was nipped, it was anæmic but quickly recovered colour after release from the sac. The distal portion of the gut was very small, the contents of the distended loops were passed on by manipulation. A little bloody fluid was present in the peritoneal cavity and this was irrigated with warm boracic lotion. Calomel gr $\frac{1}{2}$ up to grs iv was given every four hours and evening sulphate $\frac{1}{10}$ gr hypodermically, the bowels were freely opened. The temperature rose for some days after operation. The wound was dressed on the 5th day when there was a little distension beneath it with peritoneal friction, otherwise recovery was uneventful, the wound healing by 1st intention.

These two cases exemplify the difficulty of diagnosis in this condition, more particularly in regard to the history. In the first case, it varied very much from time to time, and in the second the friends, who had been with the patient throughout the whole of his illness, at first denied the existence of either a hernia or any form of scrotal swelling whatsoever. The first case also shows the value of the adage "when in doubt operate."

The only other case calling for particular mention is No 28, which showed a condition to which I have been unable to find any reference. Briefly recapitulating, it was a cæcal hernia in which the organ was much distended with gas, it was returned, and a radical cure performed.

The patient left the table in good condition, the operation took place about 9 P.M., during the night the large intestine became greatly distended, so much so that the action of the diaphragm and the heart were interfered with. Unfortunately, although the patient was seen by the Asst. Surgeon on duty several times during the night, he did not inform me of the gravity of the patient's condition until 7 A.M. when he was moribund. It is probable that an enema or the passage of a long rectal tube would have prevented a fatal termination to the case.

There were seven cases of gangrenous herniæ, five were treated by making an artificial anus, of these four died. One case treated by resection, and end to end anastomosis with Murphy's button also died, and one by excision of a small area of gangrene and suture which recovered. This is a high percentage of gangrenous cases compared with the total number recorded. The condition of most of them was so bad as to preclude all but the mildest operative measures. Barker's⁷ recent extensive resections, however, have given better results than previously, and appears to be

the method of treatment to be adopted in this class of case.

Except in case No 13 there was nothing of particular interest about them, here gangrene had supervened after only 12 hours' strangulation, due to excessive taxis by the patient, and shows the necessity of opening the sac in every case.

² Macready states that gangrene has been known to occur after only 4 hours' strangulation, Richter saw it after 8 hours and Beiger after 10 hours.

As regards treatment—Many of the above cases had been subjected to prolonged taxis before coming to hospital, and one saw the effects of this in bruising of the gut and mesentery at the time of operation, and later in some cases by the passage of blood per anum.

In some, too, in which ice had been applied for a long time the contents of the sac were found to be quite cold, and in these there was often marked distension of the abdomen after operation. The cold being another factor tending to produce paralysis of the gut, hence both these remedies should be strictly limited in the time of their application.

If there is difficulty in reduction the best treatment is to slit the canal up widely, since it is better to have the intestines inside the belly and to spend a few minutes longer in performing a radical cure than to waste time in increasing the damage to the gut by striving to return it through a small opening.

As regards mortality, the total of the above cases reached 21.5 per cent, and of these one at least (No 5) might fairly be excluded, comparing this result with a total of 959 cases collected from the records of three London Hospitals,^{9 10 11} in these the total mortality was 24 per cent.

Macready² quotes a series of 1,063 cases with a mortality of 58.4 per cent, but in these omental herniæ were excluded and the time embraced includes some years in the pre-antiseptic era. The English cases have already been published,¹² for permission to publish the majority of the Indian cases I am indebted to Col R. D. Murray, I.M.S., Lieutenant-Colonel R. H. Charles, I.M.S., Major D. M. Moir, I.M.S., and Major R. Bird, I.M.S., for whom I was acting at the time of admission of the patients.

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Indian Medical Gazette.

SEPTEMBER, 1905

THE EFFECTS OF TROPICAL LIGHT ON WHITE MEN

UNDER the above title Major C E Woodruff, M D, Surgeon, U S Army, has published a book which cannot fail to be of interest to all dwellers in the tropics. Following the theory of Von Schmaedel that the purpose of the pigmentation of the skin in all races inhabiting warm countries was to protect the individual from the effects of actinic or short wave rays Major Woodruff has taken up the subject and discussed it in a volume of 388 octavo pages. We are not impressed with the somewhat confident and dogmatic manner in which the most modern hypotheses concerning matter and force are discussed, in fact these 120 pages of introductory matter are by no means satisfactory.

The point which Major Woodruff has sought to establish is that it is tropical light rather than tropical heat which renders countries unfit for the permanent colonization of white men. To resist the harmful action of the short rays man has in the course of many centuries evolved a degree of pigmentation necessary to resist the tropical light. This assumes apparently that the various shades of pigment from the yellow Japanese to the black Negro or dark Dravidian is adapted to the varying grade of illumination from the latitude of, say, Tokio to that of equatorial Africa. According to this hypothesis, there should be a regular gradation of shade from yellow to black *pari passu* with a gradation in the intensity of the short rays of light. Is this a fact, and what proof have we of it?

We may and do admit the main fact of progressive colorisation, and agree that this change of skin colour requires a slow migration and ages of natural selection to weed out the unfit and allow of the most protected to survive and transmit their innate predisposition to a deeper skin colour to their offspring.

If this process is not carried out by insensible gradations by families and individuals moving towards the equator by slow stages, the effect is very different. Major Woodruff holds that emigrants from any zone to one with more intense light will, if the heat be not too excessive, feel

an intense stimulation, manifesting itself at first in unwonted activity, and a restlessness of mind and body, which, however, in the next generation passes into nervous irritability and instability followed by gradual degeneration of tissue and exhaustion of energy. Major Woodruff considers that in the subtropical parts of the United States the Spaniard and the Italian will in time oust the Anglo-German element, who will then become confined to New England and the North-West.

We agree with Major Woodruff that there is no such thing as acclimatisation in the individual, what is called such is only experience dearly bought, and he points to the low birth-rate of Australia as an indication that there acclimatisation is incomplete, but a similar low birth-rate in France and even in England is surely explained by very different causes. Major Woodruff is strongly against attempts at colonisation and permanent acclimatisation by intermarriage with the native population. Such attempts have proved ghastly failures, and the progeny, as seen in the South American Republics, only undergo a progressive deterioration—"struggling with governments unfit for them and no one allowed to help them," kept away (as even our author admits) by the Munnroe doctrine. On the Aryan question Major Woodruff has much to say. Primitive man, who probably appeared in some northern region moved south, but, according to our author, man moving southward degenerated mentally the brown races being superior intellectually to the black, but inferior to the white, the most "branny" (the word is our author's) race has been the Aryan who has moved southward and imposed his civilisation and his language on the darker southern races, but according to Major Woodruff that Aryan race has died out, and "the Sanscrit speaking" millions of Northern India are no more Aryans than the English speaking Negroes of the United States are Englishmen. The Aryan conquerors imposed their rules, their language and their civilisation on the aborigines, just as the Romans did in Spain, but the Aryans have long disappeared as (*ex hypothesi*) no Aryans could long survive in the valley of the Ganges.

With many of the rules laid down by Major Woodruff we can agree, but we are not convinced of his recommendations as to the liberal consumption of meat and nitrogenous foods, or in the necessity in the tropics for the moderate use of alcohol.

To this and other parts of this most suggestive book we shall probably return. It is a book which we can strongly recommend to our readers and it deserves the serious attention of all interested or engaged in the administration of tropical countries.

Current Topics.

OUR SPECIAL NUMBERS

COLONEL S. H. BROWN, CIE, and Lieut-Col G. F. A. HARRIS, FRCP, IMS, who kindly consented to adjudge the merits of the papers contributed to our special dysentery number have decided that the prize presented by Messrs Thacker, Spink & Co of Rs 100 shall be awarded to Capt E. A. C. Mathews, IMS.

We hereby announce that Messrs Thacker, Spink & Co have very kindly offered another prize of Rs 100 for next year. The subject which we propose is *How Plague is spread*.

We invite the attention of the many medical officers employed on plague duty. Our intention is to obtain a number of practical papers on this all-important subject, and to limit the subject to the methods of the spread of plague and as a consequence the best means of prevention. The papers should be sent in by 1st April 1906.

THE MATERNITY HOSPITAL, MADRAS

THE Report of the Government Maternity Hospital, Madras, is always one of interest. Doubtless equally good work is done in other and similar large institutions in the other presidency towns, but as their reports do not see the light it is difficult to compare their work. There were 1,989 obstetric cases dealt with in the Madras Hospital, and of 1901, deliveries in hospital 1,342 are classed as natural, 1,328 having shown an occipito posterior presentation, and 14 a face presentation. Of labours termed difficult, there were 122, 7 of which are classed as tedious and 115 as laborious. There were 43 cases termed preternatural, viz, inverted 21, transverse 14, and compound 8. Of the complex deliveries there were 24 cases of twins, 55 cases of hæmorrhage, 25 of eclampsia and 18 of retained membranes. Or to classify in another way, the natural labours were 69 per cent, difficult 6 per cent, preternatural 2 per cent, complex 16 per cent and abortions 6 per cent (omitting decimals). Out of 1,936 cases the age of no less than 305 was under 19 years of age. The average duration of labour in

primiparæ was 114 hours, and in multiparæ 71 hours.

The following note speaks for itself —

"The total number of deaths is 61, of which 1 case, viz, complex labour, pneumonia, remained from last year and died during 1904. Excluding 10 cases in which death occurred before delivery, the mortality is 258 which is 0.48 more than last year. Besides the above, 10 other cases were admitted in a moribund state, and if these be deducted the mortality is still further reduced to 2.08 per cent. The mortality is still very high compared with hospitals in the United Kingdom, and I am afraid it will remain so for many years to come. The reasons are very apparent, first, cases are left long in labour and are brought as a last resource to the hospital, and secondly, the ignorant barber midwife is allowed to examine and manipulate the patient before admission, and the patient is often in consequence very septic on admission. In cases of "inertia" the practice of these women is to make the patient sit over hot ashes, and even to fill the vagina with them, the result is that we see them with the vulva enormously swollen, and in some cases the skin over the buttocks sloughs from the great heat that has been applied. In cases of retained placenta the barber midwife makes her patient stand against the wall, and with her head makes forcible pressure against the abdomen, and if blood flows it is considered a good sign, and if after a time the placenta is not "forcibly expressed," she says she can do no more, and the patient is brought to hospital, probably in the last stage of collapse. Within my knowledge one case of fractured (not mere separation at the symphysis) pubic bone has been the outcome of this mode of "expression." As a contrast to this high rate of mortality, I may quote the case of our 'batta' women. A certain number of women are taken in the last month of their pregnancy who have to sleep in the shed allotted to such cases. They receive a small money dole which helps to feed them and their family. The women are generally of the poorest and dirtiest classes. Since 1894, 2,146 have been delivered, and of these 8 died, or a death rate of 0.37. These women are not examined by any one outside, and are seen as soon after labour sets in as possible. They are not all natural labours as may be seen from the following: instrumental 62, twins 12, placenta prævia 2, post partum hæmorrhage 21, adherent placenta 3, eclampsia 3, albuminuria 2, valve disease of heart 2."

As we have said in a former notice of this report, it is very desirable that the statistics of this hospital should be compiled for 10 years. The record would be one of permanent value as regards the average of incidence of the various classes of obstetric cases in the native women of Madras.

THE SPIROCHÆTE OF SYPHILIS

As the German and French literature on the discovery of the spirochæte pallida in syphilis is not readily available, we quote the following good account of it from the *Medical Chronicle* —

In a large number of cases of syphilis there have been observed in the primary sores, in the condylomata and in the inguinal glands two particular varieties of spirochætes.

The patients examined were in the primary and secondary stages (3 weeks to 3½ months after infection), one of them was a child, the subject of congenital syphilis. Metchnikoff and Roux have also observed the organisms in scrapings obtained from "secondary" papules in apes, the subjects of experimental syphilis.

Schaudinn and Hoffmann describes two distinct species of spirochætes—*Spirochæte refringens* and

spirochæte pallida The latter is considered to be more closely associated with syphilitic conditions. It varies in length from 4 to 14μ , it is thread like and spiral in appearance, being hardly 0.25μ even in the thickest forms. The number of curves present varies between six and fourteen, they are not regularly spiral, being rather abrupt in the centre, more open towards the extremities and sometimes nearly effaced. The extremities are pointed. The smaller organisms appear like the detached flagella of the typhoid bacillus. Motility is very marked, and the spirochæte is pale and almost transparent and extremely difficult to stain.

The *spirochæte pallida* has only been found in purely syphilitic lesions. The *spirochæte refringens*, whose curves are broader and more undulating, is relatively larger in size, is easily stained, and has been found in normal smegma, in balanitis, and in catarrhal disorders of the genital mucous membranes.

Method of Examination—Films or smears are made from the secretions of syphilitic sores—mucous papules due to secondary infection being preferably selected—or from excised glands. When the patient objects to the removal of the gland, some of the contents may be withdrawn by means of a syringe. In such a case, the skin after shaving is thoroughly sterilised, and then washed with normal saline solution. The gland is fixed between the left forefinger and thumb and the right hand used to pass an aseptic syringe into the gland. On raising the piston, a small quantity of white red fluid, mixed perhaps with a little adenoid tissue or blood is drawn up into the syringe. The operation is practically painless. From the fluid obtained smears or films are prepared. The method is also of use for purposes of inoculation. The films or smears are dried and fixed in absolute alcohol for ten minutes.

Staining—The fixed films are stained for 12–24 hours in Giemsa's azur blue solution.

Dissolve Giemsa's azure I, azure II, eosin (Grubler) in methyl alcohol and neutral glycerine (equal parts). Add three drops of this mixture to 10 cc of water. The *sp. pallida* is stained reddish violet.

Marino's method of staining yields more rapid but less regular results.

The films are stained for 15–60 minutes in a mixture of azure blue in methyl alcohol, and a weak aqueous solution of eosin.

The organisms are not stained by Gram's method, and undiluted carbol fuchsin gives but poor results.

For the necessary microscopic examination a 1/12th—1/20th oil immersion is necessary. Search should be extended over several hours.

With these methods the organisms sometimes exhibit a slight granular appearance, and since the chromatin stains appear to possess the strongest affinities for the spirochæte, it is probable that chromatin forms a considerable part of their structure. The spirochætes are distinctly extra cellular, but are often attached to or exhibit one end buried in the cellular protoplasm.

Up to the present attempts at artificial culture have yielded negative results.

Significance—It is yet too early to regard these the organism as sole ætiological factor in syphilis. They may prove to be non-pathogenic inhabitants of human tissues. But their presence in the deeper as well as in the surface tissues of syphilitics, lends, at all events some weight to the supposition that they are of ætiological importance. In any case they afford us special interest, since we know but little of the normal and abnormal relations of lymphatic glands to parasitic skin affections.

Are these spirochætes simply stages in the life history of flagellates? It is known that a certain species of trypanosome may cause a sexual disease—not unlike syphilis—in horses transmissible from the stallion to the brood mare, and that the parasite can even penetrate the unbroken mucosa. These facts, in addition to others, well known to pathologists, call for further investigations upon the exact local seats of the organisms

and upon the products of their metabolism and their local or remote effect upon living tissues."

MEASURES AGAINST THE SPREAD OF CEREBRO SPINAL FEVER

THE German Health Department have issued a leaflet from which the following extract is taken. There is no doubt that this disease has during this summer prevailed widely in America and on the Continent of Europe. We in India are well acquainted with the fell disease. A perusal of a number of articles in the medical papers, European and American, shows that but little new is known of the disease, and most articles are a résumé of text-book information, in fact the article in the 20th century *Practice of Medicine* contains all that is valuable in our knowledge of the disease. Herewith we quote from the German leaflet—

"The German Health Department has just issued a leaflet respecting epidemic cerebro spinal meningitis, containing instructions for combating the disease. The disease has spread widely in Silesia this winter and spring, ending fatally in about one third of the cases, in cases of recovery, deafness, blindness, maiming, and mental disorders have remained behind.

The regulations embodied in the leaflet are as follows:

(1) Epidemic cerebro spinal meningitis is an infectious disease which is caused by an invisible disease germ, the so called *Meningococcus intra-cellularis*.

(2) The sickness begins suddenly being accompanied with fever (generally ague) violent pains in the head, neck, and limbs, vomiting and unconsciousness, and a peculiar stiffness of the neck, with paralysis of individual muscles. In a number of cases death results in a few days.

(3) Infection generally takes place by means of the mucus of the nose and throat of persons suffering with the disease. Healthy persons in the vicinity of the patient, and those coming in contact with these persons, can also transmit the disease germ in the mucus of the nose and throat, and thus cause the disease to spread.

(4) Small, overcrowded, and badly ventilated rooms favor the spread of the disease.

(5) The following are the most effective protective measures:

(a) Immediate notification of each case of epidemic cerebro spinal meningitis and suspected cases to the police authorities.

(b) Strict isolation of the patient, as well as those suspected to be suffering with the disease, and transportation of the patients to a suitable hospital, if proper isolation in their residence is not practicable. The patients must not be conveyed to the hospital in cabs or other public conveyances. If this, however, in individual cases cannot be avoided the respective conveyances must be disinfected afterwards in accordance with instructions of the medical officer. The patient may not be discharged from the hospital until all danger of infection has ceased. Before leaving the hospital the patient's clothing must be disinfected and the patient bathed.

(c) The disinfection of the residence must take place immediately after the patient has been taken to the hospital, or after the disease has been cured.

(d) Children attending school, although in good health, must be kept from school if they live in the same house as the patient, until the medical authorities permit their re-admission to school.

(e) Relatives of the patient diminish the danger of a spread of the disease for themselves, as well as for persons with whom they come in contact, by the most scrupulous cleanliness, especially of the hands, and by

cleansing their throat and hands by disinfectants. For this purpose a weak solution of menthol is recommended.

For the nursing of patients suffering with epidemic cerebro spinal meningitis, the following instructions are to be observed.

(1) Those nurses in charge of cerebro spinal meningitis patients must, if possible, avoid nursing other patients.

(2) The nurses must wear washable dresses or extra large aprons. The nurses must so place themselves when attending the patients that the mucus bubbles which the patients disseminate in talking, coughing, or sneezing cannot touch them.

(3) In the patient's ward there must always be ready for use wash-basins, solution of lysol, towels, etc., for washing the hands.

(4) The saliva, sputum, gargling water, etc., of the patients must be promptly disinfected. The pocket handkerchiefs, bed linen, and body linen, as well as the eating and drinking utensils of the patients, must be also disinfected before leaving the ward.

(5) Food and nourishment of all kinds intended for other persons must not be kept in the patient's room.

(6) Every time before leaving the room of the patient the nurses must carefully disinfect their face and hands and rinse the nose and throat with a disinfecting mouth wash."

THE OPERATION OF CIRCUMCISION

The following account of his methods of operation for circumcision is taken from a lecture by Mr. Jackson Clarke at the *Polyclinic* —

"After the usual preparation, the patient is anaesthetised and the following steps are carried out —

(1) The foreskin is separated by a blunt instrument from the glans, the smegma is removed by wiping the glans and inside of the prepuce with swabs wet with $\frac{1}{20}$ carbolic, and the foreskin is then replaced in the position natural to it in the pendent position of the penis.

(2) With a sharp knife a shallow incision just deep enough to draw blood is made obliquely around the base of the foreskin a little in front of, and parallel to, the corona and prolonged nearly to the mucocutaneous junction below, i.e., over the frenum.

(3) One blade of a pair of rather narrow blunt-ended scissors is passed accurately in the middle line between the glans penis and the foreskin, and then all the tissues are cut through, the incision ceasing at the level of the corona.

(4) The mucous membrane is cut all round, leaving only enough to hold the stitches, i.e., about $\frac{1}{2}$ in.

(5) The skin incision previously marked out is completed, leaving the middle fibrous layer of the foreskin.

(6) The fibrous layer which contains the blood-vessels is now cut through about $\frac{1}{2}$ in further back than the line of the incision in the mucous membrane. Pressure forceps are applied to the bleeding points and are allowed to remain for a few minutes. If any vessel should then bleed it is tied with fine catgut. The cut edges of skin and mucous membrane are accurately united with from six to eight stitches of fine chromicised catgut that has been for at least seven days in $\frac{1}{20}$ carbolic. If the fibrous layer is not well marked, it may be picked up at various points, especially at the frenum, and cut back to the required extent.

The meatus should now be examined, if it is contracted and rounded instead of linear in form, or if it does not admit the tip of an ordinary Spencer Wells's forceps meatotomy is called for. Usually only the lower angle of the opening requires enlarging. For this purpose a blunt-pointed tenotome is inserted for about $\frac{1}{2}$ in or less, and a cut made accurately in the middle line. This cut will heal up prematurely unless a stitch of

catgut is inserted by passing a curved needle into the canal and bringing it out on the under surface of the glans penis, the stitch passing above the upper angle of the meatotomy. When the suture is tied, the knot should lie between the two raw surfaces. Sometimes another cut is required on the dorsal aspect of the meatus.

The Dressing — No dressing need be applied directly to the penis, but the latter may be drawn through a slit made in an oblong piece of white jaconet and in a somewhat smaller piece of soft linen that has been sterilised and dried. A bandage is now passed over the linen and jaconet and round the hips. Two other bandages passing round the inside of the thighs and attached at their ends to the main bandages will prevent the latter from slipping. The penis should be examined to see that it is not at all constricted where it passes through the dressings and then the latter are folded over the bandage, and its lower angles secured each with a pin in such a way that the anterior layers are rather looser than the posterior.

The linen should be changed, and the penis washed with $\frac{1}{20}$ carbolic after each micturition. The stitches will come away by themselves in nine or ten days, and the parts may then be left to Nature. The form of dressing here advocated I learnt from an article by an American surgeon, the reference to it I have unfortunately lost. It has the advantages of allowing the patient to be dressed and taken out of doors."

A SIMPLE METHOD FOR THE RADICAL CURE OF HYDROCELE

LAWRENCE (*Yale Medical Journal*, September, 1904) advocates as a safe and nearly painless operation the introduction into the hydrocele sac of an aseptic absorbable solid substance. The ideal substance is sterile catgut. The hydrocele is tapped with a small trocar under local anaesthesia, the fluid is thoroughly evacuated, and through the cannula is pushed 9 or 10 inches of a No 2 or 3 sterile catgut. The cannula is then withdrawn, and the opening is sealed with collodion or adhesive plaster. Thereafter for twelve hours the patient is kept quiet. There results a painless reaction.

The author states that a ten years' experience with this method has resulted in a permanent cure for every case, this often after repeated failures from iodine treatment. In four to six weeks the scrotum resumes a normal appearance. For more recent cases, nine inches of No 2 catgut is used, for old chronic cases with thickened sac walls, twelve inches of No 3. Of course in double hydrocele on one of the multilocular variety each sac must be drained and have its separate piece of catgut inserted. Some illustrative cases are reported, the first operated on eight years ago. This man had a hydrocele of five years' standing which had been tapped with the trocar four times, the sac refilled in about six weeks. Twenty ounces of hydrocele fluid was withdrawn, and ten inches of No 3 catgut was introduced. This man went about his former work the same evening, and although the scrotum swelled to about half the size of the filled sac and gave a firm sensation on palpation, the man experienced no pain and conditions were apparently normal in six weeks." We are afraid

that this 'simple' method would be of little avail in those cases of enormous hydroceles so common in many parts of India —(*Therapeutic Gazette*)

MANY times during the last few years have letters appeared in various newspapers in India, calling the attention of intending visitors to Europe to the beautiful district of the Austrian Eastern Alps, especially of those of Tyrol. So many of Anglo-Indians arriving for their holidays at Trieste seem at a loss where to go to recoup their health. Leave Trieste at 6-35 P.M., and one arrives by mail at Innsbruck at 1 P.M. next day (fare second class 50s). As everything in a foreign country depends on finding comfortable quarters, we may say we are informed that Innsbruck possesses a number of excellent hotels with moderate charges, and there is particularly one in which an English and Anglo-Indian colony is permanent. A well known military medical officer, writes in the *Times of India*, dated March 18th, 1903, as follows —

"About the Hotel Tyrol at Innsbruck 'It is the best hotel in the town. English is spoken by the entire establishment from the proprietor down, and at the time of writing, except a German gentleman and his wife, who, however, speak English, every visitor in the hotel is English or Anglo-Indian. This is a tolerable guarantee that English wants are understood and cared for. There are many little attentions not chargeable in the bill which make the whole atmosphere of the hotel friendly and home like, when, as often happens in Germany and Austria, the proprietor is a gentleman.' One of the great advantages of the Eastern Alps is that there are so many health giving springs and health resorts of every kind, of which our limited space allows us only to mention Meran and Botzen for autumn, winter and spring times, and the great mountain hotel of Trafoi, Karersee and the Meudl for the summer."

We quote the following from the *Edinburgh Medical Journal* (June 1905). It is obviously a matter of considerable importance in India, but we are aware of no studies on the subject in India —

"Mai and Hurt have recently investigated a question of very considerable importance, since the practice of cremation of the dead has become comparatively common, namely, whether in the cremated remains it is possible to discover traces of poisons administered during life. The problem presented itself to Mai by a case in which he was asked to determine whether poison existed in the ashes of a cremated body. The remains were contained in a metal urn, and consisted of fragments of bone and charred wood, three or four nails, and a quantity of greyish black ashes, the whole weighing about 5½ lb. The heavy metals, cyanogen compounds and arsenic were searched for, but without result. Hurt and Mai therefore instituted a series of experiments on animals in order to determine whether the discovery of poisons in cremated bodies is possible. The poisons employed were arsenic, hydrocyanic acid, and mercury. Animals were poisoned with these substances, and the bodies cremated with all due precautions to prevent the accidental presence of any of the above substances.

In the ash of the bones of the animals poisoned with arsenic well marked evidence of the presence of this poison were found, whereas no traces could be discovered in the ashes of the soft parts. The attempt to discover

indications of the presence of hydrocyanic acid or mercury in the remains of animals poisoned by such means proved negative — *Ztschr. f. anal. Chem.* 1904, *Ztschr. f. anal. chem.*, vol. xvii Heft 43

IN a useful article in the *Bristol Med. Ch. Journal* (June 1905) Dr. Charles Begg makes the following statement about the value of santonine in the treatment of spue —

"What is the by product formed by the action of light on santonine? Similar changes are known in other drugs and they are held to change their character little if at all. That santonine is changed I have the strongest of clinical proof, having over and over again demonstrated the failure of the white and curative power of the yellow in the same patient."

We have received a collection of diagrams used in the Sanitary Exhibition at the King Institute, Madras, which are well worthy of examination, and should prove most useful as diagrams for similar exhibitions or to illustrate lectures on hygiene. They illustrate the spread of cholera, the value of filtration and a good water-supply, the value of public health measures, vaccination and re-vaccination, anti-cholera and anti-plague vaccine, and the wire gauze protection of houses from mosquitoes. Everything stated is put and printed in the most telling way and with a view to catch the eye and attention of the general public.

Reviews.

Mosquitoes — Their Natural and Medical History. By Raphael Blanchard, Professor in the Faculty of Medicine, Paris, 673 pp., 316 figures, 25 francs.

THIS comprehensive work brings together, between two covers, in a manner not reached before, everything about mosquitoes — their zoological relations, their anatomy, histology and development, the systematic study of genera and species (about half the book), their rôle in the transmission of disease (120 pages), and sundry other matters, such as the destruction of adults and larvæ, the making of collections, and a bibliography of 20 pages. The author is a professional Zoologist, and has taken up mosquitoes and Parasitology with the thoroughness of an insatiable explorer. He, however, generously acknowledges the help he has had from Theobald's classical Monograph, which he has taken as a guide in the systematic portion, and he has endeavoured to address himself particularly to medical men. It thus follows that the reader will come across many diagrams and illustrations — old friends which he has seen in the Monograph, and other works.

The sub-family, Anophelinae, includes 8 genera and 61 species, but in the Appendix, which brings the account up to the 1st of January, 1905, about as many more species are added.

making a total of about 120. In these there is some little overlapping.

Classification is a difficult subject, and may generally be left to the experience of naturalists. New classifications are now common, and in recent years we have had those of Giles, Theobald, Blanchard, Liston and James, and Lutz. For the medical man, it is more important to pay attention to species, to observe what species are present in his neighbourhood, and what relation they have to disease. This book is the very thing for the medical man.

The descriptions of Indian species are full as a rule. *Myz Christophersi* (Theob., 1902) is the name Blanchard uses for one of our common malaria-carriers. He does not mention the peculiarity of the 3rd longitudinal vein which helps to distinguish it from *Myz culicifacies*. In the appendix *A fluviatilis*, James, and *A Listoni*, Liston, both = *Myz Christophersi*, are added. Of course, now we speak of *Myz Listoni* only.

Superpictus is included in *Myzomyia*, whereas Stephens and Christophers place it (after Theobald) in *Pyretophorus*. The male of *Celia Pulcherrima* is said to be unknown. It has since been met with. One or two remarks may be made regarding his description of *Nyss fuliginosus*. All the longitudinal veins do not have corresponding white patches in the wing fringe. The posterior branch of No. II is generally unprovided. The oval bright spot on the middle femora is spoken of incorrectly as a circle. The white tarsi and white bands on the legs are not clearly given. This sentence should read "Last three hind tarsi, and apex of 2nd wholly white, 1st, 2nd and 3rd tarsal joints of fore and middle legs apically tawny banded."

In one very important matter, India gives the lead, and is not yet quoted by our author, namely, the utilising of larval characters to distinguish species. Mention of course is made of clypeal hairs, and palmate hairs, but the work of Stephens, Christophers and James is not dwelt on, which is rather extraordinary.

A very full description is given of a familiar Indian mosquito, *Culex fatigans*, and of its larva, and a highly gratifying note is added to the effect, that this is Ross's "grey mosquito" used in his *Proteosoma* experiments. "These (Ross's) observations have a considerable historical importance, since they have been the starting point of all recent discoveries in connection with malaria and the pathogenic rôle of mosquitoes." This is handsome from such an authority. This common species is concerned in the carrying of filaria among men and dogs, and quite recent work appears to show it also is a carrier of a trypanosome.

Nothing is added to our knowledge of how mosquitoes tide over the winter.

Regarding the parasites of mosquitoes, Perronito describes a bacterium in the general cavity, often fatal to the host.

Grassi describes two sets of parasite, one in the general cavity, a second in the eggs. They resemble *Myxosporidia*.

Larvæ are also infected in a similar way, and Blanchard describes some anachnidæ in this connection. Other parasites are, of course, *Hæmosporidia filaria*. More than one parasite may be present at the same time.

To the medical man, the most important part of the work is that headed "mosquitoes as pathogenic agents," and takes up about 120 pages. It is highly instructive and suggestive. It begins with hints as to the preparation of specimens, fixing, and staining of films, &c. A tip is added to Ross's thick drop method to fix the film. "Ruge makes use of a mixture of formalin 2 p.c. and acetic acid $\frac{1}{2}$ to 1 p.c., the blood is fixed and the hæmoglobin dissolved." Stain them in the ordinary way. Malaria, Filaria, Yellow Fever, &c., are then taken up.

As to the varieties of malaria, our author lays down "observations of the last few years have gone to confirm the specific plurality of the Hæmatozoa of malaria, but the number of species is not yet settled." "Malaria is not a morbid entity, but a collection of morbid states, each having its specific parasite" (p. 449).

With the help of Schaudinn's figures a charming account is given of the malaria parasite's life history, beginning with a series of sketches of how the sporozoite wiggles into the red blood corpuscle. The merozoite or spore is said to get in in the same way, but as the spore is roundish, and the sporozoite spindle shaped, it is not easy to follow this process. Schaudinn's ingenious explanation of Schuffner's dots is adopted; Schaudinn indeed appears to have washed and brushed up the whole of the mosquito laboratory and no important work in this part of Pathology is without some reference to his name.

The cause of malarial periodicity still remains obscure. Rise of temperature is attributed, not to a reaction as Schaudinn thinks, but to the result of intoxication, brought about by the bursting of Sporocysts, and the setting free of deleterious substances excreted by the parasite.

Schaudinn's explanation of a relapse is accepted, and related with the original figures. Let us take an ordinary case of fever, with schizonts, microgametocytes, and macrogametes. Schizonts go on infecting until they die out. Microgametocytes are short lived, and if not rescued by the mosquito, die out. The macrogametes are long lived. If they are not also rescued by the mosquito, two things might happen to them—(a) a proportion die, (b) the rest pass through a process of cell division, producing daughter cells, which are nothing more nor less than schizonts, which bring on a fresh attack of fever. It is not clear what determines this process, but one can understand how prophylactic quinine might act.

Sporogeny, the cycle of Ross, is clearly described, and hints on fresh preparations given.

In searching for sporozoites, in the fresh state, mosquito-juice is thought better than salt solution. The dissection of salivary glands is as described by James. As to the much discussed black spores of Ross, Blanchard explains them in this way, they are produced by retrogression and involution of certain of the contents (sporoblasts and sporozoites) of the oocyst, perhaps by temperature. Would this explain their appearance sometimes in *Myz* *Rossi* and *Nys fuliginosus*, which are not ordinarily malaria carriers?

Up to the present, about 15 species (all anophelines) are known to be capable of transmitting malaria (of all three types). Perhaps it is not necessary to add, our author is a "whole-hogger" of the Mosquito-Malaria theory.

The recent work done by Schaudinn in connection with *Culex pipiens* and *Halteridium* and *Spruochæte Ziemanni* is reviewed, with the original diagrams. This is a most fascinating subject, and must be familiar to readers of Stephens and Christophers' book. It is a capital starting point for any officers wanting something to work at, as *Halteridium* is so common in India, and the subject so absorbingly interesting.

The Rôle of Mosquitoes in Yellow Fever next is gone into thoroughly, and due prominence is given to evidence which convicts *Stegomyia Calopus (fasciata)* of carrying the poison, which glorifies Goigas, the Mosquito exterminator, and which confirms a long-standing prophecy of Finlay, who years ago pointed his accusing finger to this very *stegomyia*. There are people who, to put it plainly, do not believe in the Havana Miracle, this is—before 1901, Yellow Fever and Mosquitoes were common in that town, Finlay and Goigas set to work to reduce mosquitoes and yellow fever, in 1904, the President of Cuba reported that since 1901 there had not been a single case of unimported Yellow Fever in Havana. How they did it was by taking vigorous measures against mosquitoes. Elaborate rules were framed and brigades formed. Obstructors were punished by fine and imprisonment, some were bastinadoed, others made to join Public Works, even notable citizens might have been seen on the triangle, or working as navvies for breaking rules. Scoffers will be glad to hear that in 1904 there was some spontaneous Yellow Fever in the town, and in commenting on this our author, for once in the way, shows us a humorous side of his nature. "It is to be feared, for the young Cuban republic, that, if a situation so menacing does not quickly subside, the United States will see occasion to apply a certain clause of the treaty by which they had consecrated the independence of Cuba, a clause which permits them to intervene by force of arms in case of political or sanitary disorder. Il serait vraiment curieux et excessif que Cuba perdît quelque jour son indépendance à cause de la *Stégomye*!" As to the nature of the parasite, nothing more can be said than this probably is of a protozoal nature.

Due attention is next given to mosquitoes and filaria, and the complimentary terms in which Manson is referred to are truly Gallic. (Four photographs of great men are given in this book. They are of Ross, Manson, Finlay and Grassi.) About ten mosquitoes can transmit the disease, and it would seem malaria carriers will not deal in filaria.

Other diseases which might have some relation to mosquitoes are Leprosy (Blanchard is very keen on this point), Scruvy, Dengue, Plague, Malta fever, Horse sickness of S. A. An up-to-date reference is made to Leishman Bodies, but it is thought the Tabanidæ are more likely than mosquitoes to carry Kala-azar.

Instructions and hints are given on how to collect and preserve mosquitoes, prophylaxis, and therapeutic management. There is nothing new in these, and we already possess better guidance in the works of Stephens and Christophers, James, and Giles.

Any doctor coming across this book must be smitten with a consuming desire to work at mosquitoes. Everything is so ably and simply put, the necessarily dry descriptions of species are always so easy to follow, the story of how the mosquito has been so often caught red-handed is so graphically and cunningly told, that a fairly patient worker taking up the dissection of mosquitoes is certain to come across a valuable find in a moderate space of time. There have been sensational surprises in the past (Ross), and in the present (Schaudinn), and it is almost safe to say there will be more in the future. This indeed is boldly and confidently promised by the author.

The Maintenance of Health in the Tropics —

By W. J. SIMPSON, M.D., F.R.C.P. Published under the auspices of the London School of Tropical Medicine. By John Bale, Sons, and Danielson, Limited London, 1905, pp. 113.

THIS little work is intended not for medical men, but for the general public. It may be said to fulfil its purpose well, the advice given throughout is good, and, with the exception of some of the directions about houses, not difficult to follow. It is probable that, in most of the tropical colonies, the case with regard to housing is much the same as in Indian stations, a man must take, not what he wants, or thinks theoretically perfect, but what he can get.

The book consists of four chapters on health in general under the headings of climate and personal precautions, diet, drinking water, and the dwelling-house, one long chapter on the most important tropical diseases, and two short ones on snake-bite and wounds. Of the long chapter, 35 pages, almost one-third of the book are devoted to malarial fever, then follow shorter notes on yellow fever, enteric, cholera, dysentery, plague, and diseases of the liver. In the first chapter three of the four cardinal points for preservation of health in the tropics are given.

with due weight, avoidance of exposure to the sun, to chills, and to malaria. The fourth avoidance of excess in food and drink (the first as important as the second), receives due attention later on.

We may note a few points here and there. The writer advises the use of a cholera belt. No doubt a cholera belt is useful, especially in preventing diarrhoea and dysentery, but the wearer is apt to find the part of the body covered by the belt, neatly mapped out with prickly heat, a very annoying, if not dangerous, affection. We think, too, that advice against the use of the cold bath is hardly necessary. Many men bathe in cold water throughout their Indian service with benefit, certainly without harm. It must be admitted that, for seven or eight months of the year, in Bengal, water not artificially heated can hardly be described as cold, it is naturally tepid. Under the head of cooking utensils might have been mentioned the aluminium cooking pots, recently introduced, which do away with the necessity, and the danger, of tinning. Mention might also be made of the milk of the cocoanut as a beverage. Wherever the cocoanut palm grows, unripe cocoanuts may be got all the year round, their milk or juice provides a drink refreshing, palatable, cool, and absolutely safe, a perfect boon to travellers. On page 109 the hamadryad is called the *man cobia*, this is a term new to us, though we have often heard it called the "king" *cobia*.

The book, or rather pamphlet, may be thoroughly recommended.

A Manual of Personal Hygiene, Proper Lining upon a Physiologic Basis—By American Authors. Edited by WALTER L. PYLE, A.M., M.D. Second Edition, Revised and Enlarged. W. R. Saunders and Company, Philadelphia, New York, London, 1904.

THIS work consists of eight chapters, by eight different authors on various branches of personal hygiene *viz*—(1) Digestive apparatus, (2) the skin and its appendages, (3) vocal and respiratory apparatus, (4) the ear, (5) the eye, (6) the brain and nervous system, (7) physical exercise, (8) domestic hygiene. An appendix, dealing with baths, accidents, and poisoning, completes the work, the Editor himself contributes the chapter on the eye.

The matter of the work is good, and the advice sound. There is, however, more of anatomy and physiology than we should have considered to be necessary for the general public, for whom, and not for professional readers, the work is intended. The book is of considerable length, 430 pages, and is, we should think, more likely to be used as a work of reference than to be studied from beginning to end.

If is, of course, intended in the first place for general readers in the United States, and has no special reference to the tropics or to hot

climates. On page 365, however, an invention is described, which, should it ever be perfected will be a boon to all those whose fate leads them to sweeter in the warmer regions of the world. This is the "cold stove," an apparatus designed to cool the air as an ordinary stove warms it. Two scientific men in the United States have devised apparatus for this purpose. Unfortunately, neither has yet got beyond the stage of experiment.

The American system of spelling, as in *fiber*, *center*, *theater*, *woolen*, seems strange to an English eye, as do such phrases as *back of*. A convenient word, used for washing clothes, is *laundering*. What we call oatmeal porridge appears to be known as oatmeal pudding (p. 32) in America.

There is some very curious Latin in the book. On page 121 we hear of the *Levatores costarum longi et brevis muscles*. On page 411 *coli* is used as the plural of colon.

The general get-up of the book, type, paper, and illustrations, are excellent, and we have noticed only one misprint, *delevop* for *develop*, on the second line of p. 115.

A Manual of Midwifery—By HENRY JELLETT. Demy 8vo pp. xxv and 1158, illustrations 469 plain and coloured, 9 plates. Baillière, Tindall and Cox. Price 21s net.

THIS volume forms one of the University Series of this firm of Publishers and is, we feel sure, destined to receive a hearty welcome, both from medical practitioners and students.

We have derived nothing but pleasure from the perusal of this work, the arrangement, type and diagrams are excellent, and the subject-matter is placed before the reader in a most pleasing manner. One cannot but help feeling that this is the work of a Master expounding his views and opinions gained in the actual practice of his profession, there is an intensely practical ring from cover to cover, details of treatment are clearly laid down and the opinion of the author is heard with no uncertain voice but without dogma and the views of others, whose ideas are worthy of record, are fully mentioned. We take it that this work represents the present teaching of the Dublin School of Midwifery. We have been much impressed with the candid manner in which the author has dealt with the treatment of Eclampsia and Local Septic Infection which are considered "*sub judice*," although the author does not hesitate to give in his own views of treatment. Douching both before and after delivery is not recommended, but one is inclined to feel that as far as post-partum douching is concerned, the author begs the question at issue in assuming that the douche cannot be given aseptically by the nurse.

We are in full accord with the author in reference to his strongly expressed opinion that no procedure should take place in the dark as he

says "At one time such practices were the sign of the skilful obstetrician, they are now the sign of the ignorant one"

The management of the third stage is well expressed, but we would have liked to see the great importance of a thorough and careful search for any perineal tear more emphasised

The diagrams indicating the difference between the normal and abnormal pelvis will be extremely useful to the student

We cordially wish this work every success, feeling sure that it will be one of the leading English text-books on the subject and heartily commend the volume both to the practitioners and the students

Recurrent Effusion into the Knee-joint after Injuries—By SIR WILLIAM BENNETT, K C V O, F R C S (London) Messrs Longmans, Green & Co, 1905 Price 2s 6d Pp 29 11 Illustrations

THIS is a brief analysis of 750 such cases compiled with especial reference to internal derangement of the knee-joint commonly known as 'slipped cartilage'. It was delivered as a clinical lecture at St George's Hospital, and is reprinted, after revision, from the *Lancet*

There is not much of moment in the lecture though the figures are of interest, and the observation is recorded that it is quite practicable to remove detached portions of both semilunar cartilages through one lateral incision, that incision should be on the inner side of the joint. Sir William Bennett holds it clearly demonstrated by every one of his cases that when the cartilage is displaced it is not only useless, but impossible, to fix it in its normal position with the least prospect of its remaining there

Current Literature.

REPORT ON THE PROGRESS OF ANTI MALARIAL MEASURES CARRIED OUT AT KLANG AND PORT SWETTENHAM *

I HAVE the honour to report on the progress of the anti malarial measures carried out at Klang and Port Swettenham during the past four years

2 KLANG IN 1901.—In 1901 the area of the town was approximately 290 acres, of this 22 acres was swamp, 25 acres virgin jungle, and 80 acres dense secondary growth, in places 30 or 40 feet high. I found anopheles breeding in wells swamps and ditches, and Dr Leicester has since identified six species in Klang. With such conditions it is not surprising that the town suffered greatly from malaria. Having obtained some definite facts as to its prevalence, I laid a proposal for a drainage scheme before the Sanitary Board in May, 1901, and thanks mainly to the Chairman, Mr H B Ellerton, it was included in the proposed estimates for 1902

3 The condition of the town will be gathered if I summarise a report sent to the State Surgeon in July,

1901, asking his support for the Board's proposal. In it I pointed out that (a) while the total number of cases treated at the hospital during the first half of 1901 showed an increase of 325 per cent over the corresponding period of 1900 the increase in the number of malaria cases amounted to no less than 69 per cent, (b) of these malaria cases 55 per cent came from the town, while the estates, which were better drained, sent in only 11 per cent, (c) to my personal knowledge 60 houses out of 293 within the town boundary had been infected within the previous three and a half months, (d) the prevailing type of parasite was the tropical or malignant form, (e) a water supply was shortly to be introduced and it would be unwise to bring increased moisture into a town already suffering from malaria without previously providing proper drainages, and (f) since in the returns from 1896 onwards "Malaria has been more prevalent in the latter part of the year, the marked increase of fever in the first six months of 1901 is a matter for serious consideration, and some action in the way of drainage is clearly indicated." This report was accompanied by a plan of the town showing the general distribution of the swamps, the breeding places of anopheles, and the houses infected by malaria

The proposal of the Board was strongly supported by the State Surgeon, Dr E A O Travers, and Government not only indicated at once that the proposal would be favourably considered, but ultimately doubled the sum asked for by the Board

4 It was soon evident there was good ground to fear, and malaria became a veritable scourge before the year was out. The inhabitants of house after house went down before it in the months of September, October and November

The following extracts from my note book will show how much Government officers and their families suffered. "In the new clerks' quarters, there were 11 cases, with one death, old clerks' quarters, 4 cases, clerk of works' quarters, 7 cases, adjoining quarters, 2 cases, post office, 2 cases, railway quarters, 16 cases, rest house, 5 cases, inspector of police's quarters, 6 cases, police constables, 21 cases," etc. In fact all Government quarters except three were attacked, while in the lower lying native town hardly a house escaped, and in many houses I found five or six persons ill at one time. The population was so thoroughly demoralised by the mortality in the town, which in November rose to the rate of 300 per mile per annum, that the Chinese suspended business for three days, and devoted their energies to theatres, processions, and such other rites as they thought were calculated to drive away the evil spirit

5 WORKS DONE IN KLANG.—During 1901, felling and clearing was carried out energetically by the Board, and the owners were compelled to fill in or drain private land. At an expenditure of \$26,000 the Board has drained not only the 22 acres of swamp within the town but also 16 acres of swamp adjacent, although at that time outside the town boundary

Altogether 332 acres have been affected by the drainage. In addition, 105 acres of jungle and secondary growth have been cleared and are now mostly under grass, the vote for town gardeners having been raised from \$750 to \$1,800 per annum. Very little now remains to be done, and it is in hand

6 PORT SWETTENHAM IN 1901.—The site of this town was originally a mangrove swamp covered by all high tides. The railway running along the foreshore interfered with natural drainage, and on the side furthest from the river large pools of water had collected. Drains had been cut or blocked to suit the requirement of the moment. In these pools and drains, as well as in the natural breeding places of a mangrove swamp, I found anopheles, and Dr Leicester has since identified seven species at Port Swettenham. I was not surprised to learn that the construction coolies had suffered severely from malaria, and although at the beginning of 1901 few coolies were actually living in Port Swettenham, I formed a very unfavourable opinion of it

* As one has heard a good deal about the success of the anti malarial measures at Klang, we have thought it well to publish Dr Watson's report in full.—ED, I M G

owing to the short residence necessary to infect new comers

In February, 1901, the Resident Engineer for Rail ways, at the suggestion of some members of the Klang Sanitary Board, began to clear and fill in around Government quarters, but no money was available for an extensive drainage scheme. In a memorandum on the Port, dated 20th April, 1901, in addition to measures relating to general sanitation, I recommended the following anti malarial measures (1) clearing and levelling of the Government reserve and putting it under grass, (2) the filling in of abandoned drains, (3) a complete scheme of drains to carry off and prevent the stagnation of rainwater, (4) the notification and if considered necessary the removal to hospital of cases of malaria, and (5) experiments with mosquito proof netting and with quinine on certain sections of the population. I also expressed the opinion that the "Government staff shortly to be stationed there will be seriously affected, and their services much impaired." That much was necessary was obvious, and Government put \$10,000 for "filling in" on the estimates for 1902.

7 On the 15th September, 1901, the business of the Port of Klang was transferred to Port Swettenham, with the Government population and coolies connected with the shipping. Fearing an epidemic of malaria, and desiring to have a record of it, should it occur, I had a census of the Government population taken, among other things obtaining the date of arrival of each person at the Port, and a history of any previous malarial attacks. This was completed a few days after the opening of the Port, and in order that all cases of sickness might come to my knowledge, the Deputy Health Officer, Mr. Lazaroo, visited all quarters daily. Cases were thus treated properly from the beginning and, if necessary, were removed to hospital.

Immediately after the Port was opened malaria assumed an epidemic character, and in less than a month (12th October) the 180 Chinese loading coolies were so decimated that the remnant returned to Klang. Two other batches of coolies (about 70 in each) were imported on the 10th and 20th October respectively, and were lodged in separate houses in Klang, travelling daily to Port Swettenham by train. But as Klang was in the throes of the epidemic foreshadowed by the great sickness in the early part of the year, these coolies also suffered severely and the majority left after a month. The loading contractor had then to employ Tamil coolies from his coffee estate. The population in Government quarters also suffered severely, and out of 176 persons, including the crews of the Government yacht and launches, no less than 118 were attacked between 10th September and 31st December.

Two months after the opening of the Port a visit was made to the native houses, and of the 127 inhabitants 78 were said to have been attacked, and 25 of the 27 houses infected.

8 The work of the Port was greatly inconvenienced, the Railway and Marine Departments were mainly in hospital, ships were greatly delayed, and even then some had to over carry cargo, their crews contracted malaria and deserted, while others refused to sign on, such was the notoriety of the place. The very serious nature of the epidemic having been represented to Government by the State Surgeon, Dr. E. A. O. Travers, a Commission was appointed, consisting of the State Engineer (Mr. P. B. McGlashan), the General Manager of Railways (Mr. C. E. Spooner), the Resident Engineer for Railways (Mr. A. J. W. Watkins, and later, Mr. D. J. Hight), the Director of the Institute for Medical Research (Dr. H. Wright), the State Surgeon (Dr. E. A. O. Travers), and the District Surgeon of Klang (Dr. M. Watson). It was questionable whether the Port could be kept open, but the recommendations of the Commission—bundling, draining, clearing, levelling the Government reserve, and the employment of kerosene and the administration of quinine—were given effect to at once by the Government, rapidly brought the

epidemic under control. Mosquito proof houses were not found necessary. At an expenditure of \$50,000, over 100 acres have been reclaimed.

9 RESULTS.—What may be regarded as two independent experiments on a considerable scale have thus been carried out at Klang and Port Swettenham. These two towns, five miles apart, the one on a mangrove swamp the other on and about low hills and swampy ground were in 1901 probably the most malarious areas in the district. But the district, apart from the towns, also suffers from malaria, and may be regarded as a check on "control" to the experiments. The conditions throughout have been uniform, except for the drainage works in the towns and the introduction of a water supply, and I know of no factors except these which could have affected the following statistics. The population has been rapidly increasing for many years. As the following statistics will show, malaria has practically if not absolutely disappeared from the two places in which the anti malarial works have been carried out, while the remainder of the district remains much as it was.

10 MALARIA TREATED AT THE HOSPITAL, KLANG.—Since 1901 the number of cases of malaria has diminished greatly, as the following table shows—

Table showing the number of malaria cases treated at the Klang Hospital, and their percentage to the number treated for all diseases

Year	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904
Outdoor	172	470	730	554	694	668	737	965	364	245	210
Indoor	91	112	158	128	103	251	467	807	403	219	298
Total	268	581	888	682	857	919	1,204	1,772	767	464	508
Percentage	20.4	28.9	25.0	19.7	25.2	20.2	24.9	38.8	20.4	12.1	11.1

The decrease is very striking, and the following table enables one to appreciate the cause of the decrease.

Table showing the residence of cases of malaria admitted to hospital

Residence	1901	1902	1903	1904
Klang and Port Swettenham	610	199	69	32
Elsewhere	197	204	150	266

Situated in a malarious country as Klang and Port Swettenham are, their inhabitants are liable to infection should they pass a night away from home in the neighbourhood, and, on the other hand, imported cases are frequent in both towns. A difficulty arises in connection with the classification of the residence of new arrivals who, giving a history of malaria before coming to Klang, develop symptoms again after they have been in the town more than eight days—the minimum incubation period of malaria. Such cases are probably relapses but it is also possible that a new infection has been contracted in Klang. In order not to under estimate the number of cases contracted in Klang and Port Swettenham, and thus over estimate the benefit derived from the anti malarial works, in the foregoing table a residence of eight days free from symptoms within the towns brings a case under the heading "Klang and Port Swettenham," notwithstanding any previous history of malaria before arrival. In the light of these remarks it is not uninteresting to note that of the 32 cases recorded from Klang and Port Swettenham in 1904, eight were probably imported cases, having definite histories of malaria before arrival, three* were Klang residents who nine to twelve days before admission had slept of the town, and eight were ricksha pullers who frequently sleep away from home after a long journey instead of returning to town.

* One was my boy. On 28th October I found the Jugra rest-houskeeper had malignant malaria (severe crescent infection). Despite a warning, my boy slept in the man's room. From the 6th to the 9th November the boy complained of headache and on the 10th and 11th his temperatures were 103.5° and 104° F and on the 12th malignant parasites were found in his blood.

The following table is evidence of a considerable saving of life

Table showing the residence of fatal malaria cases admitted to Klang Hospital

Residence	1901	1902	1903	1904
Klang and Port Swettenham	52	8	5	0
Elsewhere	19	23	14	27

11 MORTALITY IN THE DISTRICT—As the population of District of Klang increased 198.8 per cent between 1891 and 1901, and is still rapidly increasing, the mortality bills naturally increased, but since 1901 there has been a decrease as the following table shows—

Table showing the number of deaths registered in the District

Year	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904
Number of deaths	206	342	511	403	475	538	780	993	547	543	612

When the register is further analysed, the decreased mortality is found to have taken place in the two towns

Tables showing the causes and places of deaths registered in the District, corrected for deaths occurring in Hospital (i.e., the place of residence being taken for the classification)

Klang and Port Swettenham (population about 4,000 in 1901 and increasing)—

	1900	1901	1902	1903	1904
Fever	259	368	59	46	48
Other diseases	215	214	85	69	74
Total	474	582	144	115	122

Elsewhere in the District (population about 14,000 in 1901 and increasing)—

	1900	1901	1902	1903	1904
Fever	173	266	227	230	286
Other diseases	133	150	176	193	204
Total	306	416	403	428	490

The above tables bring out in the most convincing manner that subsequent to the undertaking of the anti malarial works, there has been a great diminution in the number of deaths recorded in Klang and Port Swettenham while in the rest of the district the number of deaths recorded still increases

It is evident, too, from the first table that the improved health in the towns is mainly due to the great reduction in the prevalence of malaria. But striking as this reduction appears from the table, the actual reduction has been still greater, for among the deaths recorded as due to "other diseases" many were doubtless due to malaria, for the native informant is prone to report deaths really due to malaria as due to diarrhoea, dysentery, convulsions in children, or other terminal complication of malaria. Indeed, natives so frequently fail to recognise that their illnesses are connected with malaria that it has been found necessary to examine microscopically for malaria parasites the blood of all cases with symptoms of diarrhoea, dysentery, anaemia, cardiac and renal diseases admitted to the hospital at Klang, irrespective of whether the patient says he has had "fever" or not. That the native informant of death should make a mistake can therefore be easily understood

At the same time the removal of malaria from the two towns has undoubtedly improved the general health so much that many who in previous years would have succumbed to "other diseases" than malaria, simply because they were in a low state of health consequent on malaria, are now able to resist the attack of such "other diseases," or if attacked to overcome them and recover

Although a good water supply was brought into the towns in December, 1902, and greater attention is being paid to general sanitation, I cannot help feeling that the improvement in the health of the towns has been due mainly to the diminution of malaria, and as all deaths

with the exception of those certified by myself are registered in accordance with the report of the friends, I regard the above tables as an "unsolicited testimonial" unconsciously given by the native community to the effect of the anti-malarial work in Klang and Port Swettenham

12 CHILDREN INFECTED WITH MALARIA—Unfortunately during 1901 no examination of children was made to ascertain the percentage infected, but that they suffered severely I had abundant evidence both in my official and private practice. The disease frequently ran through a household, as an example of which I may mention that on one occasion (15-4-01) when called to the Astana I found no less than 15 children suffering from malaria. In 1901, at Port Swettenham, there were in Government quarters 13 children under 10 years, of whom 9 contracted malaria in 3½ months after their arrival. In 1904, selecting November as the most unhealthy month of the year, I personally examined the blood of a number of children under ten years of age, taken without selection except as to place. Every child at Port Swettenham, including those in native houses as far as the 4th mile on the Klang road, was examined. At Klang the children were from all parts of the town. As a "control," children were examined in the villages of Batu Tiga, Damansara, Padang Jawa, Bukit Raji, Telok Gadong, Kapar, etc., and are grouped in the remainder of the District

Table showing infection of children with malaria November and December 1904

Place	No examined	No infected	Percentage infected
Klang	173	1	0.57
Port Swettenham	87	1	1.14
Remainder of District	298	101	33.89

The 32 children in Government quarters at Port Swettenham have been examined twice, with a negative result as regards malaria on the second occasion. As if to emphasise the freedom from malaria of those permanently resident in the towns, the two cases found in Klang and Port Swettenham were clearly imported cases. The one at Port Swettenham with benign tertian malaria was the daughter of a police sergeant transferred from the distant village of Cheras, where she had had fever off and on for four months. She had an attack of fever two days after her arrival at Port Swettenham, and her blood was examined on the tenth day after arrival. The other child, a crescent infection, belonged to a company of native players. At the date of examination he had been 15 days in Klang, but he gave a definite history of fever previous to arrival, and he had had no fever while in Klang.

The percentage of children infected is generally regarded as the most delicate test of the amount of malaria in any locality. According to this test Klang and Port Swettenham appear to be absolutely free from malaria except such as is imported.

13 IMPROVED HEALTH OF GOVERNMENT OFFICERS—The following table shows how much Government and its officers have benefited

Table showing the number of certificates and of days of sick leave given to officers resident in Klang and Port Swettenham on account of malaria

	1901	1902	1903	1904
Certificates	236	40	23	14
Days of leave	1,026	198	73	71

No less than 40 of the 71 days in 1904 were granted to two officers who contracted the disease at Jugra. Except for these, no officer resident in Klang or Port Swettenham has suffered from malaria since 12th July 1904.

Table showing the number of attacks of malaria (including relapses) in Government quarters at Port Swettenham

	1901 (15th Sept. to 31st Dec)	1902	1903	1904
No of attacks	188	98	35	6

All the five cases in 1904 (one policeman had two attacks) were imported cases giving clear histories of

malaria shortly before their arrivals. In Klang I knew of 71 cases of malaria in Government quarters in three months, September, October and November, 1901. In the corresponding months of 1904 I knew of no cases except five which were imported. Among the non official population connected with Port Swettenham in 1901, I believe there were about 70 deaths. Of the official population, thanks to the steps taken to obtain early information of illness, only two died, in both instances men who absconded from hospital and refused treatment. This is striking testimony to the value of quinine.

14 The following and final figures I cannot help regarding with less satisfaction, nor can I quite decide whether they should be adduced as proof of the success of the works or reckoned in their cost. In 1901 the book value of my private practice for attendance on malaria patients resident in Klang and Port Swettenham was \$734. In 1904 I had not a single private patient in the two towns with malaria. There was not even the chance of making a bad debt.

15 CONCLUSION.—In this climate, where no cold season even temporarily stops the mosquito pest, the eradication of malaria might well appear a hopeless task. To the Engineers of the Public Works Department is due the credit of having devised and carried out the works, and I would assuredly be failing in my duty were I to omit from this record the names of Messrs P. B. McGlashan, J. E. Jackson, W. R. Sanginetti and J. F. Ward, who have brought about so successful an issue. To say that in Klang and Port Swettenham one is as safe from malaria as in London would perhaps be premature, yet, as I have shown, it is not far from the truth, and the work of another year should make it wholly so.

For this result no small measure of praise is due to the Sanitary Board of Klang, which throughout has pursued a definite policy of permanent drainage—for all the works are permanent. And finally, to the Government honour is due as the first British administration to follow Ross in a serious attempt to confer on those entrusted to its care the benefits of his great discovery.

I have, etc.,

M. WATSON,

District Surgeon, Klang

KLANG, 9th February, 1905

MEDICINE

The Principles and some Refinements of Percussion.—(1) *On the methods of percussion employed in Edinburgh and Glasgow*, by W. T. Gardner, F.R.C.S., M.D., L.L.D., F.R.S. *The Edinburgh Medical Journal*, November 1903.

(2) *The practical aspects of Dorsal Percussion and in particular of Percussion of the spine*, by William Ewart, M.D., Cantab., F.R.C.P., London. *The Lancet*, 29th July 1899.

Seeing how dependent the medical man is upon percussion as a means of obtaining information as to the state of the viscera no apology is needed for the review of a lecture delivered 5 years ago, for the reason that, when considered in conjunction with that of Sir William Gardner, the larger part of the art of percussion is dealt with.

Sir William Gardner's lecture deals primarily with abdominal percussion, and the whole subject centres round the use of a "carefully minimised percussion stroke." The method which he adopts is as follows. First the presence of fluid in the abdomen is eliminated by the ordinary methods, then, taking into consideration the fact that the whole of the anterior wall of the abdomen gives rise to a well defined, though not identical, tympanic note, which is reached by a nearly equal force of percussion stroke all over its anterior surface, find the minimum strength of percussion which will elicit this sign, the "carefully minimised percussion stroke."

If, while using such a carefully minimised percussion stroke, there is found any part of the abdomen absolutely without sound, this is due to some solid body lying just under the abdominal wall. If this body is thin and so "easily penetrated" by percussion it will give a resonant note to slightly stronger percussion and so may be easily missed. By attention to these details a thickened omentum or the thin edge of the liver can be defined with accuracy. The lecturer states that percussion is, as a rule, too hard and that in proportion as it is heavy it loses in accuracy, this being in accordance with "physical laws which no amount of experience can evade or set at naught, that percussion does not operate directly downwards, or in the direction of the impact only, but, in proportion to the strength of the stroke, laterally diagonally and in every possible direction, in edging sound. Deep percussion (so called) is necessarily inexact percussion." He has not however space in the article "to trace out this principle into a refutation of all the nonsense that has been written in books about the deep and superficial, absolute and relative limits of certain organs according to percussion. By no sort of management is it physically possible to determine accurately an edge or limit or any kind or definite form of an object even half an inch below the wall of the thoracic or abdominal cavities under ordinary circumstances."

Bearing these physical principles in mind it is interesting to note how under certain well defined conditions it is possible to elicit a dull percussion note from deeply situated organs and structures. This matter has been dealt with by Dr. Ewart in the lecture quoted above, the fundamental principles of pleximetry being fully considered. They are as follows—1 Every pleximeter has a note of its own. 2 This individual note, which adds itself to the transmitted notes is usually of high pitch and will intensify any slight dullnesses, and these are thus rendered quite obvious. Hence the great advantage of the pleximeter in analytical percussion. 3 An isolated pleximeter tends when percussed to give a uniform note in whichever part it be struck. 4 It also tends to transmit by conduction over its whole surface that quality of sound which predominates in contact with any considerable part of it. In this way slight local dullnesses may be submerged in a prevailing resonance. 5 Nevertheless a large pleximeter in its different parts will be capable of yielding different values of sound according to the underlying material. 6 Every rib and bone in the chest capable of being percussed is a pleximeter with a note of its own which modifies that of the vibrations which it may transmit. 7 On the other hand, pathological changes within the bones itself may greatly modify the note which it would yield normally. He illustrates these principles by the following examples. A Sanson's pleximeter consists of a stem connecting a small surface or knob with a large sound-collecting surface. If percussed in the air it yields a high pitched note. A vertebra is essentially the same, although its stem is double and its sound collecting surface convex. It too gives out a sound of its own when percussed and this note so obtained is altered if the density of the vertebra be changed by filling its interstices with wax. The scapula is a huge pleximeter, and if the acromial process be percussed a very resonant note is obtained by conduction from the underlying lung. But when pleuritic effusion rises high enough in the chest dullness may be taken up and conveyed by the scapula beyond the actual site of the fluid. Nevertheless fractional dullnesses of small size, such as those due to broncho-pneumonia, may with care be picked out over limited districts of the scapula.

When percussing the tip of the spine of a vertebra in the body, one is getting information as to the condition of the structures lying against the front and sides of its body. These mostly contain air, so that the general note, especially on forcible percussion, is resonant. On light percussion however [for reasons made evident in Sir William Gardner's article] the note given out by

different vertebrae differs according to the varying amount of solid matter intervening between the bone and the lung. These slight, though significant differences, require the accentuating characteristics of a pleximeter to bring them out, and it is usually only by the aid of Sanson's pleximeter that the following modifications in tone can be made out. The cervical and four upper dorsal vertebrae are resonant. The fifth dorsal spine normally gives out a dull note owing to the presence in front of its body of the infratracheal glands and other mediastinal structures, and this dullness is much more evident when these glands are enlarged. The sixth and seventh spines are slightly dull owing to the general damping effect of the heart, and the eighth and ninth more so owing to that of the left auricle. The tenth and eleventh spines are also slightly dull on account of the liver. The second lumbar spine is relatively dull and there is a very slightly dull patch about 2 inches long over the sacrum just below its base. Not only, however, is there a general epinal resonance, elicited by percussion on the tips of the spines of the vertebrae and collected by the bodies from the adjacent air containing viscera, but this is conducted laterally from the spines and transverse processes, so that percussion with a pleximeter shows a lateral band of vertebral resonance about an inch broad on either side of the middle line. Lying on either side of the bands of vertebral resonance are certain dull areas, and these, extending across the resonant vertebral bands, modify but do not nullify their resonance. These areas of dullness are the interscapular, the post-cordial with the left auricle dulness, the post-hepatic, and in pericardial effusion the "lower dorsal dull patch." The interscapular dulness is a lozenge-shaped area bilaterally centered on the fifth dorsal spine and corresponding to the pulmonary incisures formed by the roots of the lungs, and lying beside the third, fourth, fifth, and sixth spines. Below it is the cardiac dulness, convex to the right, pointed to the left, stretching more to the left than to the right of the middle line and densest opposite the eighth and ninth spines, the being due to the left auricle. Concerning the normal left auricle dulness, Dr Ewart says "It is of semilunar shape, convex upwards placed almost symmetrically across the middle line sometimes extending a little further to the right than to the left, resting on the hepatic line as a base and extending vertically from about the eighth to the ninth spine. It is surrounded above and at the sides by the much less marked dulnesses belonging to the rest of the cardiac area. The resonance of the eighth and ninth spines is considerably affected by it and the ninth spine in particular is always comparatively dull. I can confidently recommend students to practise this percussion, for whosoever has once succeeded in identifying the left auricle will experience no difficulty in always finding it, its dulness being greater than that of any other part of the post-cordial outline. The value of this examination is great, for the left auricle is liable to considerable variations in size and in mitral stenosis to great dilatation. The post-hepatic dulness tapers from the broad right end across the middle line to a point which lies immediately below the other triangular dulness, that of the heart, and which combines with it to form the broad apex which may be percussed out in any chest below the angle of the left scapula. The post-splenic dulness is well recognised. The areas described above are all normally present. There is another however which is only associated with pericardial effusion and not with enlargement of the heart. He calls it the lower dorsal dull patch. It corresponds to the eleventh and twelfth spines, is quadrilateral in shape, extends more to the left than to the right of the middle line, and measures 4 inches vertically and 5 or 6 horizontally. Of it Dr Ewart says, "You will probably agree with my view that this dulness is that of the liver pancreas and other abdominal solids unusually conducted to the back. It is not the fulness of a pericardial effusion, for that would occupy a higher level, but it is the

visceral dulness intensified by the fluid spreading over the surface of the liver and acting upon its vibrations as a mute"

C L

ANNUAL REPORTS

THE HONGKONG HOSPITALS' REPORT, 1904

As usual there is much of interest in the Report submitted by the Principal Civil Medical Officer at Hongkong. The year was a healthy one, there was a considerable decrease in the number of malaria fever cases, both among the troops and the civil population. Influenza was absent, and there was less dengue prevalent than usual. There was an increase in typhoid admissions to the Government Civil Hospital and a decided increase in the amount of dysentery cases. Plague was less prevalent, and the epidemic was a mild one. Dr Ho Kam Tong reports very favourably on the treatment of plague by large doses of carbolic acid. We cannot, however, find in the report the amount of carbolic used in each case.

The Victoria Jail had a daily average strength of 726 prisoners with a death rate per mille of 23 per mille. There is a note on the curious practice of "dumping bodies," i.e., throwing them in the street, probably to save cost of burial. Dr Hunter, whose work on plague is well known, states that tuberculosis is very common among the Chinese.

There is an interesting note on the progress of anti-malarial measures in Hongkong. Since 1901 the sum of 67,947 dollars have been spent in clearing out nullahs, and 11,890 dollars on "combating mosquitoes," and along with this we have the following figures of the number of cases of malarial fever admitted to the three Civil Hospitals, in 1901 there were 1,393 admissions, in 1903, 816 admissions, in 1903, 644 admissions, and in 1904 only 490 admissions. The Principal Civil Medical Officer thereon remarks—

"I know of no sanitary works hitherto undertaken which have given such a satisfactory return not only in the diminution of sickness but also in the saving of life. It is necessary that this should be continued even more thoroughly in the future as there is still an amount of preventive malarial fever in this Colony which it is our duty to minimize as far as possible."

The Superintendent of the Civil Hospital has the following note on malarial relapses—

"The question of relapse in malaria is an interesting one but not easy to settle in the tropics as it is impossible to eliminate the chance of a fresh infection in any particular case and one's theories regarding the subject can only be speculative. Apart from 'crescents' which do not occur in all cases and which sooner or later die out, no latent form has been discovered *post mortem* to account for the relapse. The fact that out of 127 Europeans none have been in more than once is worth noting. The bulk of the repeat cases (11 out of 17) were from the same station and only six came from different stations. Thirteen came in each time with the same form of malaria, and 4 with different form. The Indian with four attacks came in first with malignant, next with simple tertian, again with malignant, and finally with simple tertian, at intervals of almost exactly a month. The other three with different forms of malaria had first malignant attacks followed by simple tertian and quartan respectively. These four cases must be eliminated from the list of 'relapses' as the disease breeds true so that the number is small out of such a large force. Only six cases showed crescents in their blood on admission and of these only two were in twice at intervals of a month and two months respectively."

The types of malarial infection were as follows—

"Malarial Fever—Two hundred and twenty one (221) cases against 346 in 1902 and 787 in 1901, so it would appear as if this disease were also on the wane. Two deaths occurred as the result of the disease both being of the 'coma' form. The varieties of malaria met with were—

Malignant	77.7 per cent
Simple Tertian	14.1
Quartan	1.7
Mixed Infection	6.4

The diseases associated with malaria were—

Dysentery	8 cases
Beri beri	2
Peripheral Neuritis	1
Dengue Fever	2
Bright's Disease	1
Injuries	1

There were very few bad 'crescent' cases so that no very systematic trial of drugs against this form could be carried out. Neither iron nor carbolic acid in large doses seem to have any effect. Of those under treatment 26.8 per cent were Europeans, 46.7 Indians, 24.2 Chinese, and 2.1 Japanese.

There were treated in the hospital 42 cases of typhoid. Intestinal antiseptics proved a failure. The serious import of green spinach like stools is noted. Widal's reaction "was just as often positive as negative" and is said to have been of no use clinically.

On the subject of Febricula the following remarks are of interest—

"*Febricula*—One hundred and twenty eight cases against 96. Every endeavour is made to keep down this list, a refuge when all other causes of fever have been excluded. No doubt a few may be malarial where owing to the administration of quinine before arrival in hospital the parasites have disappeared from the blood. There are two causes of mild febrile attacks which I have noticed and which I do not think sufficient stress is laid upon, viz., syphilis and constipation. I have now collected a fair number of irregular fevers, occurring in young adults, without any definite symptoms in which as soon as an anti-syphilitic course of treatment is adopted the fever at once subsides. We have also had several cases in which a result of chronic constipation a species of auto-intoxication has set in, and after free and thorough purging all symptoms have subsided. These cases present in addition to the temperature a furred tongue, general malaise and in some cases complaint of general abdominal discomfort or pain in right iliac fossa, in fact one or two have been sent in as cases of appendicitis. A weekly or bi-weekly action of the bowels being a habit with them they are surprised when told they are constipated and still more so when their bowels are opened two or three times daily."

The following note on dysentery may be quoted, and it may be added that there was only one case of liver abscess among them.

"*Dysentery*—One hundred and six cases with six deaths against 50 cases last year—a serious increase which requires consideration. Of this number, 45 were Europeans, 44 Indians, 13 Chinese and 4 Japanese.

Whatever be the actual cause in each particular case there is no doubt that this disease must be classed in the "typhoid" group, i.e., a disease almost solely spread by contaminated water or uncooked vegetables especially when the latter are watered as they are in this part of the world. It is also significant that the number in which no microscopic cause could be ascertained and which are placed in the bacillary group have risen very considerably. Using a continuous water supply as an intermittent one is no doubt responsible for some of the spread of these water borne diseases as the vacuum in the pipes at times must be greater than any valve will stand and so dirt and germs must get drawn into the pipes. The storage of water in all sorts of receptacles and places is probably even more responsible, and lastly the system of manuring vegetables as employed in this country is not only disgusting but extremely dangerous to health, not only giving rise to serious illnesses but to a good many minor ailments which are at least unpleasant.

Several of the cases have been very serious ones necessitating the patients leaving the tropics for good or for a considerable time. Two cases were interesting as from them the incubation period of the disease may be inferred, a somewhat difficult matter in tropical diseases. Both were on their way out from home and were on shore for the first time at Singapore. Forty eight hours after, at sea, they were attacked with typical dysentery. One I regret to say died shortly after admission. The cases were presumably of the bacillary type. The Japanese referred to in last year's report as having Amœbe and Ankylostoma eggs in his stool again came in with dysentery and was extremely ill but nothing was found in his stools. I found that occasionally when magnesium sulphate failed to cure, the substitution of the soda salt proved of immediate benefit.

Divided into apparent causes the cases are as follows—

1	23 cases with Amœbe Coli
2	" " Cercomonas Intestinalis
3	" " Distoma Crassum eggs
4	8 " Malarial parasites in the blood
5	71 " nothing to be found in stool or blood ("bacillary")

There does not appear to be much surgery done in the Hongkong Hospitals as compared with those in India—for e.g., Table V gives the list of operations totalling only 283 in the Government Civil Hospital, as follows: 29 amputations, 49 tubercles, 1 ovarian tumour, 2 cataracts, 1 pterygium, 9 hydroceles, 1 hernia, 2 liver abscesses, 6 operations for piles, 6 abdominal sections, 1 operation for appendicitis. In a similar sized Indian Hospital the number of operation for cataract, hydroceles, piles, pterygium would be much more. There is no mention of any cases of stone.

THE BOMBAY LUNATIC ASYLUMS

THERE are seven lunatic asylums in the Bombay Presidency, viz., at Colaba for Europeans and for Natives at Naupada, Ratnagiri, Poona, Dharwar, Ahmedabad, and Hyderabad

(Sindoo). The European Asylum at Colaba has accommodation for 90 Europeans, 70 males, 20 females, and for 168 natives, 104 males and 64 females. The largest purely Native Asylum in the Presidency is at Naupada, with a capacity for 198 males and 42 females. The floor area per patient is 30 square feet, by no means too much for this class of patient. The daily average strength of lunatics in all the asylums was 823, showing an increase over the average for the two previous years, of this the daily average of criminal lunatics was 112.

The numbers admitted during the year under various types of insanity were mania 206, melancholia 118, delusional insanity 43, dementia 21, idiocy 8, mental stupor 7, and general paralysis of the insane 2. The admissions from mania and melancholia showed an increase of 29 and 31 cases respectively over the preceding year, whereas those from dementia gave a decrease of 8.

As regards the alleged causes of insanity among the admissions, a cause is given in 207 and is unknown in 194 cases. Of the known causes 163 cases are attributed to physical and 44 to moral causes. Of the former, the abuse of spirits and intoxicating drugs accounts for 53 cases, mental trouble 23, previous attacks 22, fever 13, hereditary causes 13, epilepsy 10, sun stroke 6, injury to head 4, masturbation 3, syphilis, fright and congenital disease 2 each, and plague, small pox, paralysis, child birth, climate, sexual excess, miscarriage and hysteria 1 each.

During the year under review the health of the inmates has, on the whole, been satisfactory. The daily average sick was 236, equal to a percentage of 29 on the daily average strength against 43 in the previous year. The total mortality was 58, or 8 less than in the previous year. The average ratio of deaths per mille to the total population in all the asylums was 49.0, and that to the daily average strength 70.4, as compared with 59.2 and 82.8 respectively in 1903. There was a reduction in the death rate at Naupada, Dharwar, Ahmedabad and Hyderabad, whereas Colaba, Ratnagiri and Poona showed an increase as compared with the previous year. This is accounted for by the fact that a number of cases were on admission in an advanced stage of decline from disease or were suffering from chronic ailment and were, owing to their disturbed mental conditions, unable to take the rest necessary for the preservation of strength.

THE CENTRAL INDIA HOSPITAL REPORTS, 1903

THIS report was sent in in May 1904 by Major J. R. Roberts, F.R.C.S., I.M.S., the A.M.O. in Central India. It was not printed till November 1904, and only reached us late in June 1905. It is therefore somewhat out of date. In the year 1903, no less than 37 new dispensaries were opened, 23 in the Indore State and 8 in Bundelkhand, no less than 1½ lakhs of patients attended these dispensaries or 145 per 1,000 of the population. The decrease in the number of malarial fever treated is attributed to the evacuation of populous centres in W. Malwa owing to plague. The wave of syphilis which seems to have followed the famine year of 1897 and 1899 still persists. The western portion of the Agency suffered from a severe bout of plague, 2,364 cases. The following is the brief but graphic account given by Major Roberts—

"The rainfall was very high in July and the black cotton soil was converted into a morass, camping grounds under these circumstances were difficult to prepare and evacuation could not be carried out as desired. In addition hundreds of panic-stricken people poured out of Mhow and Indore into the villages, carrying plague with them, others fled by rail to seek an asylum wherever they were admitted. Under the circumstances it can be imagined that labour for building camps was scarce or unobtainable, materials could only be collected in insufficient quantities, and circumstances necessitated that camp huts must be water-proof or people could not possibly inhabit them—a fact that added to the difficulty of the situation. The epidemic was, under the circumstances in Mhow and Indore, of unprecedented severity, compared with other parts that have been attacked by plague. Mhow lost 5,130 persons out of a population of 36,039, Indore Residency Bazar 966 persons out of a population of 11,118 and Indore city showed 9,019 deaths out of 86,636 inhabitants. How terrible was the condition of Mhow can be judged by the following: if the number of troops (not followers) is excluded the population was about 32,000. Of these 5,130 died in Mhow, over 2,000 were traced as being attacked with plague and having died in their flight, bringing the total loss to 7,200 persons or 22.5 per cent. In the Indore Residency Bazar the loss was 8.6 per cent. In Indore city it was 10.4 per cent. In the latter case I do not think the figures are correct, 9,019 is the number of deaths registered and reported, whereas the estimate is over 12,000. The advantages of a better sanitation, of wider roads, streets and lanes, were in favour of Mhow as compared with Indore and yet it suffered more severely—a circumstance that has previously been noticed in the etiology of plague. Considering that these towns were in a large part evacuated, the incidence of cases among those whose circumstances did not permit them of

fleeing, was extremely high. How high it is impossible to say as census of those remaining in the towns during the epidemic could not be made. In this case plague and the monsoon went hand in hand disappearing together, but with the dry weather the disease continued a less rapid, but still decided march through the country, spreading to the districts of Indore State, and appearing in the Malwa division of Gwalior. In Neemuch Cantonment it broke out in the month of August, and continued until November 1903, causing 356 deaths. Ujjain was at last attacked in November, though for months it had protected itself from the disease by a rigid detention of princely stricken refugees, twelve thousand of these were pressed through its detention camp.

This was the first visitation up to date of Central India.

The following list gives the most important surgical operations done —

Nature of operations	1903	1902	Percentage cured	Percentage died	REMARKS
Cataract Lenses extracted	475	471	55		
Lithotomy	50	96	94	02	
Litholapaxy	98		98	02	
Removal of Calculi in Urethra	40		100		
Laprotomy	4	3	75	25	
Nephrectomy	1		100		
Cholecystotomy	1		100		
Radical cure for Inguinal Hernia	8		75		
Porros' Operation	4	5	50	20	
Ovariectomy	1		100		

Last year we commented on the Jail death rates. This year Major Roberts remarks as follows —

"There has been an improvement in the health of the Central Jail Lashkai, each prisoner being treated over 11 times instead of over 14 times as last year. Of the admissions 9.97 per cent were for diseases of the digestive system and 11.47 per cent for diseases of the respiratory system, making a favourable comparison with last year when those diseases accounted for over 50 per cent of the sickness. The high rate of mortality in the Bhopal Jail was due to an excess of grain diet which was served out improperly cooked owing to the insufficient issue of firewood. This was corrected at the suggestion of the Agency Surgeon Bhopal, and a marked improvement in the health of the prisoners has since taken place."

The death rate in the Jail at Lashkai is still however 115 per mille of the average strength, there having been no less than 102 deaths out of an average strength of 891. In the Central Agency Jail at Indore things were very different, the death rate being only 8 per mille.

THE RAJPUTANA MEDICAL AND SANITARY REPORT

THIS report for the year 1903 was forwarded to the Government of India in October 1904, was printed in November 1904, but only reached our table in June 1905 somewhat late for a review to be of any practical interest. Cholera was absent, and there was but little plague in 1903 in Ajmer Merwara. Measles apparently was prevalent, as in the United Provinces in that year. In the Native State plague is reported to have existed in most of them, in most cases imported from elsewhere. Inoculation was only done in two States owing to popular opposition but Capt. Scott Moncreiff performed 1,391 inoculations in the Shahpura State. On the whole the measures adopted have been successful, thanks to the energy of the Medical Officers attached to the States. The Ajmere Jail shows the very low death rate of 7 per mille. The year is described as healthy and prosperous, and much is noted as being done to improve the jails in Native States. The death rates vary very much, but the average for all the jails works out at 33 per mille, and varies from nil in the small jail at Karavi and 7 per mille in the important Central Jail, Ajmere, to 109.4, in Banswara, where out of a daily average strength of but 95 prisoners no less than 19 died.

Overcrowding was marked in the large jail at Jodhpur, in Jeypore Central, in Bharatpur, at Udaipur, Banswara and Parbatgarh jails. Turning to Statement III, A, we find a large number of operations done in the dispensaries of Rajputana, viz., 634 cataracts on 590 patients, 546 are reported as cured, 34 remained in hospital and 21 are "discharged otherwise." For hemorrhoids 12 operations by injection, 24 by ligature, 23 by excision, and 3 by cautery. For vesical calculi, there was one supra pubic lithotomy, 38 lateral perineal, 6 by lithotomy, 83 by litholapaxy (75 cured, 1 otherwise, 6 died, 2 remained).

It is a pity that this report could not be issued earlier.

Correspondence

ENTERIC FEVER IN INDIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In reference to the somewhat obscure etiology of enteric fever in India the following note may be of interest. European official attacked by enteric fever on 24th May 1905. It transpired that he had been in close attendance on a native child, the daughter of one of the servants in his compound. This child refused to take nourishment from other hands than his.

Learning that the child in question had had continuous fever uninfluenced by quinine, for about a month, I took a sample of its blood.

This specimen was taken on the 34th day of the child's illness at which time the temperature had been normal for four days.

Sent to the Kasauli Institute. Capt G Lamb I.M.S., kindly furnished the following report: "The blood sent gives the following reaction with typhoid 1/40 complete, 1/80 nearly complete."

It seems pretty clear that A contracted enteric from this native child. In the sporadic cases of enteric so common among young Europeans in India it might be useful to make careful enquiries among the servants in the compound. Should a case be discovered one could then, as in the present instance, take steps to disinfect the quarters, &c., and thus destroy a focus of infection otherwise very liable to be overlooked.

Yours, &c,

SEONI, C P }
30th June, 1905 }

J O S OXLEY,
CAPT, I.M.S.

MANGOES AND BOILS

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In Major Roberts' interesting *Notes on casual cases* he mentions that in his opinion boils said to be due to mangoes are really caused by milk, butter, &c., which have lost their purity through the heat, this may be the case sometimes, but I believe myself that the chief cause of prickly heat and boils is the great acidity of the sweat in some patients leading to irritation inflammation and suppuration of the sweat glands, this view will account for many facts in the etiology of prickly heat, for instance, mangoes, mango fool, tainted milk, butter, &c. all cause this malady owing to the acid they contain, likewise a high consumption of butcher's meat and rich foods leading often to much formation of uric acid will produce prickly heat.

It is remarkable what relief is obtained from 15 gr doses of bicarbonate of soda three times daily and the use of an alkaline wash to the affected parts.

Yours, &c,

W H COX,
CAPT, I.M.S.,
109th Infantry.

DEPRESSED SIMPLE FRACTURE OF THE SKULL

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—Hira Lall, 15, H M, cultivator was admitted into the Ray Hospital, Daibhanga, on the 13th April, 1905, with a large swelling in the left side of the head and right hemiplegia.

Stated that about a week ago when he was watering the fields, the bamboo of the lever fell down on his head. He dropped down unconscious and remained in that condition for about half an hour. Next morning a large swelling on the left side of head was noticed. Paralysis of the right half of the body then supervened, it was first noticed in the upper extremity, then spread to the lower extremity.

The swelling was situated on the left parietal eminence, and it was of the size of an orange. Subconjunctival ecchymosis present in both eyes. No history of bleeding or escape of water from the ear or nose. Was perfectly conscious but a little dull in intellect. Speech was normal but a little slow. Control over bladder and rectum intact.

Next morning the patient was put under chloroform and a crucial incision was made over the swelling. Dark clots of blood were removed. There were two fractures cutting each other in an acute angle, extending from the parietal to the temporal bone. There was a depression of the piece in the lower retiring angle. This piece was elevated by an elevator and sawn off by Hey's saw. The duramater was

not opened. A few wire stitches were applied and the centre of the wound was kept open for free drainage. Thorough aseptic precautions were taken in the operation.

15th April, 1905 — Dressings were soaked and therefore changed. Slight rise of temperature in the evening. Sensation in the palm of the hand and sole of the feet returning.

17th April, 1905 — Temperature normal, dressings changed, no discharge.

23rd April, 1905 — Dressings changed, slight discharge, can flex his leg.

27th April, 1905 — Can raise his hand, condition much better, sub conjunctival ecchymosis almost gone.

4th May, 1905 — Walking with the aid of a stick, wound nearly healed up. Sub conjunctival ecchymosis gone.

8th May, 1905 — Discharged cured. Walked well, though kept the use of the stick still. Intellect and speech restored perfectly.

Yours &c

K P LAHIRI

12th July, 1905

Service Notes

THE annual dinner of the Indian Medical Service at the New Gaiety Restaurant on June 8th brought together some forty eight officers of the service past and present. The chair was occupied by Surgeon-General J Oglehorn, CSI, a former Director General.

The toasts of "The King" and of "The Queen and other members of the Royal Family" having been duly honoured, Surgeon-General Sir A C C DERENZY, KCB proposed "The Sister Services," making allusion to the various bonds which united them. Surgeon-General A Keogh, CB, having been prevented at the last moment from attending the dinner, the task of reply fell upon Inspector-General H W Ellis, RN, alone. After touching lightly upon the part which each service played in the work of the empire, he recalled some memories of the time when officers of all three services alike underwent a course of instruction at Netley together.

The toast of the guests was proposed by Surgeon-General A W Branfoot, CIE, the present Director General, I M S, who made grateful acknowledgment of the support and assistance which the service was accustomed to receive from the medical press and especially from the organ of the British Medical Association. In a suitable response on behalf of himself and the other guests Sir R Douglas Powell pointed to the scientific work which had been done by officers of the Indian Medical Service, and reminded those present that the profession at large still looked to it to throw light on many as yet unsolved problems of tropical medicine.

The last formal toast of the evening was that of the Indian Medical Service, in proposing which, Mr John Langton said, that the reputation which the service had justly attained was punctuated in his mind by the fact that many of the best men who had passed through his hands as an examiner, and in other ways had entered its ranks. In his reply, Surgeon-General Oglehorn reminded his hearers of the honourable traditions of the service. It was through one of their predecessors that the old East India Company obtained its first concession. Broughton, the officer in question, had been instrumental in saving the life of the Emperor Jehan's daughter and named as his sole reward a concession for the Company as to trading. Since then the service by its influence on the people through its medical work had steadily been helping to oil the wheels of Government and many were the officers who had distinguished themselves in various ways. Accusations of slowness in taking advantage of opportunities for original research and in the organization of a complete sanitary system were occasionally launched at the service, but they who knew the local conditions and circumstances understood the difficulties which surrounded the path of progress in particular directions. Laboratories, however, were now being established, and other facilities offered for original investigations, and in due course results would follow. Although they had had to make bricks without straw, they had been able to meet the requirements of the country. The immensity of medical and surgical work, the number of medical institutions, the colleges, schools, hospitals, dispensaries and asylums, for which they were responsible were practically unknown out of India. All this medical work was spread over the whole of India and Burmah, and had developed a sympathetic and kindly feeling between the members of the service and the natives of India, a feeling which extended to the guardians and reformers of the criminal class, for practically the whole of the Jail Department had grown up and developed under selected officers of the Medical Service. The manifold duties and responsibilities which devolved on the service, and the unique opportunities which occasionally presented themselves to the man of special talents, combined with the pay and pension, were the main induce-

ments which attracted men to the service, but there were others not so apparent, thus, they entered the service at an impressionable age, in a land full of mysteries, with customs and beliefs different to their own. The responsibilities they had to face developed character and tended to make men of them. There were, of course, drawbacks, but on the whole, he thought they had all made a wise choice in selecting the Indian Medical Service as a career.

THE following order will be read with interest and some curiosity —

Medical Department—Specialist Pay—In supersession of all previous instructions the Government of India have sanctioned the provisional adoption of the following rules for the grant of specialist pay to officers of the Royal Army Medical Corps and Indian Medical Service —

General

(1) Specialist pay is an allowance to officers below the rank of Lieutenant Colonel for special sanitary or medical work done for the State which it is not in the power of the ordinary medical officer to perform with the same efficiency as the specialist. It will not be a personal allowance, but will be granted only to the incumbents of certain specified appointments.

(2) Specialist pay will not be given to officers of the Indian Medical Service in civil employ.

(3) The services of specialists are absolutely at the disposal of Government in any way they may direct, without further claim for remuneration.

(4) Except in connection with dental appointments the duties of all specialist appointments must be carried out in addition to ordinary hospital duties.

Qualification

(5) Officers of the Royal Army Medical Corps in India will be eligible for appointment as specialists under the qualifications laid down by the Army Council for the Royal Army Medical Corps.

(6) The eligibility of an officer of the Indian Medical Service for specialist pay will be decided by the Director General Indian Medical Service, whose decision will be based either on certificates of a recognised institution, or by examination of the candidate. An officer may qualify as a specialist at any period of his service. The allowance will be admissible to any officer who is in a position actually to perform the duties for which it is given.

Appointments

(7) There shall be 105 appointments in India for which specialist pay at Rs 60 a month shall be granted. Of these appointments 55 will belong to the Royal Army Medical Corps and 50 to the Indian Medical Service in military employ. Selection for appointments will be made under the orders of His Excellency the Commander in Chief.

(8) The following appointments will carry specialist pay —

Character of appointment	Special branch of science	Distribution	Number of each class
Prevention of disease	(a) Public health (b) Parasitology (including bacteriology)	2 to each laboratory established at the head quarter stations of Divisions or Brigades	44
Medicine and surgery	(c) Dermatology (including syphilis)* (d) Operative surgery	1 per division 1 ditto	30
Physical science	(e) Fevers (f) Electricity (including skiagraphy)	1 ditto 1 ditto	10
Diseases of special regions	(g) Dental surgery* (h) Ophthalmology	1 ditto 1 per command	16
Mental science	(i) Otology, Laryngology, Rhinology	1 ditto	2
Disease of women and children	(j) Psychological medicine (l) Midwifery and diseases of women and children	All India Ditto	3

* Military Department No 2457 D, dated 8th June 1905

We quote the following from Corps Notes in R A M C Journal—

"Redistribution of Principal Medical Officers in India—It is understood that owing to the abolition of Madras as a Command, and the consequent reduction of one Surgeon General in India, the appointment of Principal Medical Officer of the Western Command will, on the occurrence of the next vacancy among General Officers of the Army Medical Service in India, be filled by section from the Madras establishment of the Indian Medical Service. The distribution of Surgeon Generals will then normally be—

	A M S	I M S
Principal Medical Officer in India	1	—
Northern Command	—	1
Western Command	—	1
Eastern Command	1	—
Total	2	2

"Military Hospital Equipment—There is one item in the Military Budget for the coming year that will be welcomed by every Army Medical Officer serving in India—this is the allotment of one and a half lakhs of rupees (Rs. 1,50,000) for the improvement of the surgical equipment in military hospitals.

"Specialists' Appointments in India—The following scheme has been outlined as a measure suitable for India. Specialist appointments to the number of 105 will probably be created as suitable candidates are available, of these appointments, 55 will be reserved for the R A M C and 50 for the I M S. The pay of certain appointments such as dental surgeons will only be open to officers of the R A M C, who will be whole time officers if the scheme turns out on trial to be successful. The following appointments will carry specialist pay, and such pay will not be personal but will go to the holder of the particular appointment as detailed below—

"Prevention of Disease (44)—(a) Public Health, (b) Parasitology (including Bacteriology), 2 to each district laboratory.

"Medicine and Surgery (30)—(c) Dermatology (including Syphilis) 1 per division (d) Operative Surgery 1 per division.

"Physical Science (10)—(f) Electricity (including Skinography), 1 per division.

"Disease of Special Regions—(g) Dental Surgery 1 per division, (h) Ophthalmology, 1 per command, (i) Otolaryngology, Rhinology 1 per command.

"Mental Science (2 for all India)—(j) Psychological Medicine, 1 per command.

"Disease of Women and Children (3)—(l) Midwifery and Disease of Women and Children 1 per command.

"It will be noted that the proportions laid down in the above table are in the direct ratio as to efficiency of troops for war. When the army takes the field specialists will accompany it.

"In the case of the I M S specialist pay will be admissible to any officer below the administrative grade who is in a position actually to perform the duties for which it is given. The rate of pay will be the same for all appointments, and its officers may qualify as a specialist at any period of their service.

"The eligibility of I M S officers for specialist pay will be decided by the Director General Indian Medical Service, who will either accept a certificate granted by the R A M C College, or himself arrange for the examination of the candidate.

CAPTAIN T H FOULKES, I M S (Madras), and Captain W Selby, D.S.O., I M S, have been successful at the final examination for F R C S, England.

CAPTAIN N S WELLS I M S, has been appointed to act as Civil Surgeon of Orchar.

THE London Gazette of 11th July notices that the Royal Warrant, in relation to promotion and precedence in the Indian Medical Service dated 23rd November 1903, is amended thus—(1) The following is added to Article 1 "The Director General of our Indian Medical Service shall hold the substantive rank of Surgeon General, but may rank as Lieutenant General when approved by our Secretary of State for India in Council." (2) The following is substituted for Articles 3 and 4 "Except as otherwise herein provided a Captain shall be promoted to the rank of Major on completing twelve years full pay service but this period may be reduced by six months in the case of an officer who produces satisfactory evidence of progress in any branch of knowledge which is likely to increase his efficiency. Except as otherwise herein provided, a Major shall be promoted to the rank of Lieutenant Colonel on completing eight years' full pay

service in the rank of Major." (3) The following is added to Article 10 "An officer below the rank of Colonel who may be appointed as our Honorary Physician or Surgeon after retirement from the service shall be granted the honorary rank of Colonel." (4) The following is inserted in Article 12 at the head of the table of ages at which officers shall be placed on the retired list "Director General 62."

THE services of Captain W C Long, I M S, Captain E W Browne, I M S, and Lieutenant J Forest, M B, I M S, are placed temporarily at the disposal of the Government of Madras.

CAPTAIN G E CHARLES, M B, I M S, is appointed to the medical charge 6th Jat Light Infantry, vice Captain Holdich Leicester, F R C S, transferred to permanent civil employ in Bengal.

WE quote the following account of the French "Netley" from *Journal of R A M C*—

"The Val de Grace combines the Military Medical School and a Hospital of 1,100 beds. Originally constructed in the seventeenth century for a Benedictine monastery, by Anne of Austria as a thank offering for the birth of her son, Louis XIV it was devoted to its present purpose in 1852, and received its first batch of probationers in 1853.

French military medical officers pass the first four years of their curriculum in the preparatory college affiliated to the University of Lyons. The candidates successful in the competitive examination at the close of that course, having taken the doctorate of the University, pass on to the Val de Grace to receive the military medical portion of their training.

Being already university graduates they enter the school as commissioned officers in the rank of aide-major of the second class, wearing the uniform and receiving the pay of their grade. They reside outside, coming to the college for their instruction. The course lasts ten months and is closed by a competitive examination, according to the result of which the officers take seniority amongst themselves. Each early class consists of some sixty to eighty officers. We had the good fortune to see the present class on their way to the riding school, and they struck us as being particularly smart well turned out and set up.

Though the school and the hospital are two distinct institutions, they are so dovetailed into each other as to form but one establishment.

The present Director is M. Delorme, Medecin-Inspecteur (Member of the Academy of Medicine) and he is aided by a Deputy Director, who is at the same time Principal Medical Officer of the hospital.

The physicians and surgeons of the hospital are professors in the school.

The teaching staff includes professors and assistant professors. The former of whom there are seven (including one pharmacist), are selected from the past assistant professors and are nominated for ten years. The latter are chosen by competitive examination and hold office for five years.

The school is very completely equipped. It has a well found library and a richly stocked anatomical and pathological museum, the latter containing the admirable series of specimens of lesions caused by small calibre bullets collected and arranged with such skill by Monsieur Delorme and which we had the good fortune to have demonstrated to us by himself.

Another feature of great interest was a collection of models of the various apparatus and improvisations used under war conditions by the Military Medical Service, which M. Delorme is now engaged in founding and developing. This museum is evidently a labour of love with him and will prove of the greatest educational value to the young officers. It is full of practical suggestions, and points to a gap in our educational equipment which it were well should be quickly filled."

MEDICAL DEPARTMENT—ATTENDANCE—With reference to India Army Order No 666 of 1904 it is notified that the Government of India have sanctioned the grant of a deputation allowance of Rs 3 per diem to a lady nurse of Queen Alexandra's Military Nursing Service for India for each day of authorised absence from her permanent station, when she is specially detailed by competent authority for the duty of nursing individual cases of sickness.

MEDICAL DEPARTMENT—ARMY BEARER CORPS—The Government of India have sanctioned the exemption of men of the Army Bearer Corps from the duty of punkha-pulling. 2 The words "punkha pulling" in line 3 of the last paragraph of India Army Circular, clause 93 of 1902, should be expunged.

EXAMINATIONS FOR PROMOTION—In continuation of India Army Order No 376, current, the following officers passed also in the subjects noted against their names on the 1st March 1905 and following days—

Lieutenant Rutherford, T C, I M S	(b) in and in
" Heron, D	ditto
" Keats, H O	ditto
" Reynolds, L	ditto
" White, F N	ditto

RULES FOR DEALING WITH SOLDIERS WHO "RUN AMOK"
—The Government of India have approved of the following rules for dealing with soldiers who "run amok"—

- (1) When an armed soldier (British or native) has broken loose in the manner commonly known as "running amok" and is at large threatening or purposing to kill any one in particular or all or any in general, it is the duty of all officers and soldiers to take steps to effect his capture and to prevent his carrying his threats or purpose into execution
- (2) In doing this an officer or soldier is entitled to take such measures of force as may be necessary in the circumstances of the case and may take the life of the offender if there be no other reasonable means of preventing his carrying his threats or purpose into execution. If, however, it appears from the offender's action, *e.g.*, from his laying down his arms, that he intends to surrender, he should be arrested in the ordinary way and dealt with in due course of law
- (3) It is not necessary for an officer or soldier before taking measures of force to go up to the man who is running amok and demand his surrender if by so doing he would incur imminent risk of losing his own life
- (4) An order to shoot down the offender in such cases, given by an officer or non commissioned officer, is a lawful command and must be obeyed

MAJOR P W O'GORMAN, I M S, Medical Storekeeper to Government, Mian Mir, has been allowed 90 days privilege leave under Art. 260, C S Regulations, and Lieutenant J Johnstone, M D, I M S, holds temporary charge of the Depot during the absence of Major O'Gorman

THREE months' privilege leave is granted to Military Assistant Surgeon R. T. Rodgers, Amraoti

THE retirement of Colonel C Little, M D, I M S, is dated from 12th February 1905

COLONEL T E L BATE, I M S, C I E, has been appointed Inspector General of Civil Hospitals, Punjab. He has been for many years Inspector General of Prisons in that province

CAPTAIN J G G SWAN, M B, I M S, has joined the Punjab for Plague duty temporarily

LIEUTENANT F P MACKIE, M B, F R C S, I M S, has joined civil employ, Bombay

CAPTAIN F N WINDSOR, I M S, who has been acting for Mr Hankin in the Agra Laboratory has been appointed Chemical Examiner and Bacteriologist to the Government of Burma

CAPTAIN J W LITTLE, I M S, acts as Agency Surgeon in Kota and Jhalawar

LIEUTENANT COLONEL H N V HARRINGTON, I M S, is appointed Residency Surgeon, Western States of Rajputana

LIEUTENANT COLONEL A M CROFTS, I M S, officiates as Agency Surgeon and A M O in N-W Frontier Province

MAJOR P J LUMSDEN, I M S, is granted 17 months combined leave with effect from 24th June 1905

THE undermentioned officers have been permitted, by the Secretary of State for India, to retire from the service, subject to His Majesty's approval, with effect from the dates specified

Lieutenant-Colonel George Tucker Thomas, Indian Medical Service, Madras,—26th June 1905

Lieutenant-Colonel Patrick Fenelon O'Connor, C B, Indian Medical Service, Bengal,—13th July 1905

Major George Thomas Mould, Indian Medical Service, Bengal,—28th July 1905

LIEUTENANT COLONEL JAMES CROFTS, M D, Indian Medical Service, Bengal, is permitted to retire from the service, subject to His Majesty's approval, with effect from the 15th July 1905

SENIOR ASSISTANT SURGEON AND HONORARY CAPTAIN SIMON PAIS, Indian Subordinate Medical Department, Bombay, is permitted to retire from the service, subject to His Majesty's approval, with effect from the 1st April 1905

PAY AND ALLOWANCES—The Government of India have been pleased to decide that every Officer appointed by duo authority to officiate in a privilege leave vacancy caused by the grant to the permanent incumbent of combined leave or otherwise or in a chain of arrangements consequent thereon, shall, for the purposes of staff pay or command allowance, be treated as if himself on privilege leave, and accordingly be held entitled during such period to the full staff pay or command allowance (if any) of his own permanent appointment.

II—This ruling is subject to the proviso that the officiating officer in each case will be regarded as having availed himself of privilege leave during the year concerned, but the fulfilment of this proviso will not be held to prejudice the officiating officer's completion of the thirty three months required by Army Regulations, India, Volume I, Part I, Article 663, towards the accumulation of ninety days' privilege leave.

MAJOR ERNEST HUDSON F R C S, I M S, Superintendent Central Jail, Allahabad, was granted six weeks, privilege, leave

ON completion of his special duty Lieutenant Colonel Mansford, I M S, was granted privilege leave for one month and nine days

CAPTAIN R G TURNER, I M S, officiated as Superintendent of the Allahabad Central Jail during absence on leave of Major E Hudson, I M S

LIEUTENANT COLONEL H B BRIGGS, I M S, has been permitted to return to duty in India

CAPTAIN L P STEPHEN, I M S, 110th Light Infantry, has been granted one year's leave on private affairs

DRESS—INDIAN ARMY AND INDIAN MEDICAL SERVICE—GREATCOATS—The Government of India have sanctioned the adoption, by British officers of the Indian Army and officers of the Indian Medical Service, of the universal pattern greatcoat described on page 3 of the War Office Dress Regulations, 1904, except that the shoulder straps will be of plain melton cloth, the same colour as the garment, and without any edging

2. Officers are permitted to wear out the greatcoats in their possession before being required to provide themselves with those of the universal pattern now adopted for all services

IN modification of a former order dated 3rd May 1904, the services of Lieutenant S R Christophers, M B, I M S, are placed temporarily at the disposal of the Madras Government.

THE following officers are confirmed in Civil employ, Bombay: Captain H A F Knappton, I M S, Major J B Jameson, M B, I M S, Captain V B Brunett, M B, I M S, and in the United Provinces, Captain R G Turner, I M S, and Captain H J Walton, M B, F R C S, L M S

LIEUTENANT G I DAVIS, I M S, is transferred from Jhelum to Amritsar on plague duty

LIEUTENANT H ROSS, I M S, was posted to Forozepore on plague duty but soon after went to Rawal Pindi to officiate as

Civil Surgeon during the absence on privilege leave of Lieutenant Colonel S Little, I M S

LIEUTENANT COLONEL C MONKS, I M S, was granted 60 days' privilege leave from 27th July 1905, and Major S E Prall, I M S, was appointed to act as Port Health Officer at Aden, during the absence of Lieutenant-Colonel Monk

LIEUTENANT COLONEL J CROFTS, I M S, is permitted to retire from the service

MAJOR T W IRVINE, I M S, has got six months' leave

LIEUTENANT J P CAMERON, I M S, has joined the Madras Jail Department

MAJOR W C VICKERS, I M S, had been granted one year's leave to Europe

MAJOR G G GIFFARD I M S, has got an extension of privilege leave.

OF the leave granted to Captain C G Webster, I M S, six months and twelve days has been converted into study leave

LIEUTENANT I FORREST, I M S, has joined the Civil Medical Department, Madras

CAPTAIN W SELBY F R C S, I M S, had study leave from 1st November 1904, till 20th May 1905

CAPTAIN C A SPRAWSON, I M S, took over the Civil Medical charge of Jhansi on 21st June 1905

MAJOR R. J MACNAMARA, I M S, is appointed Inspector General of Prisons, Punjab, *vice* Col Bate, promoted

CAPTAIN H D PELLE, I M S, is appointed Superintendent of the Montgomery Central Jail and Civil Surgeon, *vice* Captain E L Ward, I M S

THE furlough granted to Captain J Stevenson, I M S, is extended by four months

MAJOR D M DAVIDSON, I M S, becomes a Civil Surgeon, 1st class, *vice* Lieutenant-Colonel Cunningham, I M S, on furlough

THE combined leave granted to Lieutenant Colonel R. J Baker, M D, I M S, is cancelled at his own request

THE services of Lieutenant-Colonel W G H Henderson, F R C S I, are placed at the disposal of the Government of India

THE services of Lieutenant G F I Hortnen, I M S, are replaced at the disposal of the Military Department

LIEUTENANT COLONEL G S A. RANKING, M D, I M S, has been permitted to retire with effect from 30th May, 1905

CAPTAIN H A WILLIAMS, I M S, has passed the elementary standard in Burmese "with great credit," and also the Lower Standard

LIEUTENANT COLONEL C H BEATSON, Indian Medical Service, to be Principal Medical Officer, Kohat Brigade, *vice* Colonel J T B Bookay, C B, I M S, Indian Medical Service, whose tenure has expired

LIEUTENANT COLONEL G J KELLIE, Indian Medical Service, to be Principal Medical Officer, Derajat and Baran Brigades *vice* Lieutenant Colonel C H Beatson, Indian Medical Service, appointed Principal Medical Officer, Kohat Brigade

MAJOR F WYVILLE THOMSON, I M S, was granted his extension of leave for two months

MAJOR W H OGILVIE, I M S, made over charge of the Civil Medical duties of Jhelum to Lieutenant W W Jewdine, I M S, on 5th July 1905

ON transfer from Umballa Lieutenant W J Collinson, I M S, was placed on special duty in the Kangra Valley with effect from 24th April 1905

THE services of Captain W C H Forster, M B, I M S, and of Lieutenant F A F Barnardo, I M S, are replaced at the disposal of H E the Commander in Chief in the *Gazette of India* of 29th July

CAPTAIN T S B WILLIAMS, I M S, is granted privilege leave for three months from 20th July

ON the promotion of Lieutenant Colonel W G H Henderson, F R C S I, I M S, Lieutenant-Colonel W H Burke, M B, I M S, is appointed Civil Surgeon of Poona

MAJOR J G HOJEL, M B, I M S, is appointed Surgeon to the G T Hospital *vice* Lieutenant-Colonel Burke, I M S

CAPTAIN A HOOTON, M B, I M S, was allowed to return to duty within the period of his leave

CAPTAIN F W SUMNER, I M S, has been granted six months leave (m c) on recovery from his recent serious accident

LIEUTENANT COLONEL F A ROGERS, I M S Civil Surgeon, has been granted by His Majesty's Secretary of State for India an extension of leave for four months on medical certificate

ASSISTANT SURGEON KALI NATH BANERJEE, attached to the Krishnagar Dispensary, acted as a Civil Surgeon and held medical charge of the civil station of Nadia in addition to his own duties from the forenoon of 15th May to the afternoon of the 29th May 1905

THE following officers of the Indian Medical Service are appointed to be second class Civil Surgeons in Bengal in the place of the officers named against each —

Captain S Anderson, *vice* Lieutenant-Colonel U N. Mookerjee, I M S, retired

Captain J W F Rait, *vice* Lieutenant-Colonel R Maorne, I M S, transferred

Captain H. Innes, *vice* Major D M. Moir, I M S, transferred

Captain J C H Leicester, *vice* Captain A W R. Cochrane, I M S, transferred

LIEUTENANT COLONEL J H Tull Walsh, I M S, who went on leave in January last has retired from the service

LIEUTENANT-COLONEL R. H. WHITWELL, I M S, Civil Surgeon of Patna, will shortly retire from the service

SURGEON GENERAL J P GREANY, I M S, is confirmed in the appointment of Surgeon General to Government of Bombay with effect from 20th June 1905

CAPTAIN V H ROBERTS, I M S, is granted 90 days' leave

CAPTAIN A. W R. COCHRANE, F R C S, I M S, the Superintendent, Central Lunatic Asylum, Agra, was granted ten weeks' leave on medical certificate from 7th May 1905

CAPTAIN G T BIRDWOOD, I M S, Civil Surgeon, Agra, acted as Superintendent, Lunatic Asylum, Agra, in addition to his own duties, *vice* Captain Cochrane

MAJOR T JACKSON, I M S, went on six months' leave, and Captain R W Anthony, M B, I M S, acts as Superintendent of Matheran

LIEUTENANT COLONEL W. H. QUIKE, F.R.C.S., acts as Principal, Medical College, Bombay, in addition to his own duties, *vice* Lieutenant Colonel H. P. Dimmock, M.D., on privilege leave.

CAPTAIN T. S. NOVIS, I.M.S., acts as Professor of Midwifery, *vice* Lieutenant Colonel Dimmock.

CAPTAIN J. C. S. OALEY, I.M.S., is appointed Civil Surgeon of Chhindwara, C.P.

As was to be expected the experiences in the East have emphasized the value of the first dressing packet. Colonel Wredin, Chief Surgeon in Manchuria, states that their use in the Russian service is universal and emphasizes the advantage of having them composed of antiseptic,—not alone aseptic,—material, since disinfection of hands and wounds is impossible on the battlefield. He notes also the advantage of the antiseptic in preventing the deposition of larvæ by the omnipresent fly. The saturation of the dressing materials with a five to ten per cent solution of carbolic acid commends itself strongly to his judgment, since it is most offensive to flies. He uses wadding saturated with talc for profusely suppurating injuries.

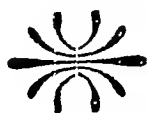
LIEUTENANT COLONEL T. H. SWFFNY, I.M.S., has been permitted to return within the period of his leave.

CAPTAIN R. G. TURNBULL, I.M.S., is confirmed as a Civil Surgeon, W.P.

UNIVERSAL regret will be felt in Bengal at the departure of Colonel S. H. Browne, M.D., C.I.E., Inspector General of Civil Hospitals, Bengal. Colonel Browne has had a very distinguished career in India, as a Civil Surgeon, in the Central Provinces, as Civil Surgeon of Simla, and for many years as Principal of the Medical College, Lahore. He succeeded Colonel T. H. Hendley, C.I.E., in April 1903, and will have put in three years as Inspector General in Bengal on the completion of his eight months' leave in April 1906.

COLONEL RODERICK MACRAE, I.M.S., now Inspector General of Civil Hospitals, Burma, will succeed Colonel Browne in Bengal, and will be welcomed back to his old Province, where he has lived so many years as Civil Surgeon.

LIEUTENANT COLONEL R. H. CHARLES, F.R.C.S.I., Professor of Surgery in the Calcutta Medical College, takes short leave before joining the staff of the Prince of Wales in November. Captain Thurston, F.R.C.S., Eng., will act for Lieutenant Colonel Charles.



THERAPEUTIC NOTES AND PREPARATIONS

THE THERAPEUTICS OF ASPIRIN AND MESOTAN (a)

By J. BURNET, M.A., M.B., M.R.C.P., EDIN

Senior Clinical Tutor, Extramural Wards, Royal Infirmary, Registrar, Royal Hospital for Sick Children, and Physician to the Marshall Street Dispensary, Edinburgh.

ASPIRIN is the acetic ester of salicylic acid. It occurs as fine white, acicular crystals, possessing a distinctly acid odour, and an agreeable acid taste. Dilute alkaline solutions readily dissolve it, splitting it up into its component

parts. It is only slightly soluble in an acid medium. It differs chiefly from other salicyl compounds in being much less irritating to the gastric mucous membrane. It tends to increase the heart's activity, and does not produce tinnitus aurium. Its presence in the urine can be detected shortly after its administration. It is best given in a glass of lemon water, and must on no account be prescribed along with alkalis, not in the form of tablets. The average single adult dose is from 10 to 15 grains.

It is in rheumatism and rheumatic affections that aspirin is more especially to be employed. I have given it in over 200 cases. To get the best results it should be given in full doses, and its administration should not be discontinued too early. It is useful in lumbago and in pleurodynia. In cases of chorea I have had remarkably good results from the use of aspirin. In fact, I have yet to meet with a case of chorea in which aspirin, given in suitable doses, failed to bring about alleviation of the condition. It should, however, be given in doses of from 10 to 15 grains. Children take it well, and it never produces toxic symptoms. In acute rheumatism of childhood I have likewise found aspirin of value. It should be given in 5 to 10 grain doses every three or four hours. It is also of service in many cases of tonsillitis of rheumatic origin occurring in children.

In rheumatic eye affections, such as iritis, it will be found invaluable. In the treatment of the hectic fever of tuberculosis small doses of aspirin possess the power of reducing the temperature. As an analgesic it can be recommended, not only in many cases of neuralgia but specially in sciatica, neuritis, and even in malignant conditions. In certain forms of influenza aspirin proves extremely useful. In cases of glycosuria, as first pointed out by Williamson, of Manchester, aspirin alone is able to reduce the amount of sugar excretion.

In my opinion, aspirin entirely replaces all other salicyl compounds, as it is a more powerful analgesic and antithermic agent than any of the others. Mesotan is the methoxymethyl ester of salicylic acid. It is a pale, yellowish fluid, possessing very little odour. It is readily absorbed by the skin. Having used it in nearly 200 cases, I am able to testify to its value, more especially in cases of muscular rheumatism. It is also of value in arthritis deformans, and in sciatica, two cases of the latter being greatly relieved by its application.

(a) Abstract of Paper read before the Therapeutical Society on March 25th, 1905.

Notice

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Bengal Hospitals Report.
Assam Dispensaries Report.
Assam Vaccination Report.
Assam Sanitary Report.
Bengal Chemical Examiners Report.
Madras General Hospital Report.
Bombay Asylum Report.
Hong Kong Medical Report.
Lingard's Filarial Embryos.
First Report of Henry Phipps' Institute.
Bengal Asylums Report.
Strength and Diet, Russell, Longmans.
British Sanatoria Annual.

LETTERS, COMMUNICATIONS RECEIVED FROM.—

Major Henry Smith, I.M.S., Jullundur. Major Browning Smith, Simla. Major Maynard, I.M.S., Calcutta. Major Vaughan, I.M.S., Calcutta. Major Dyer, I.M.S., London. Capt. Mathews, I.M.S., Tanjore. Lt.-Col. Harris, Calcutta. Dr. N. Cook, Calcutta. Capt. Sumner, I.M.S., Simla. The Sanitary Commissioner, Simla. Capt. Oxley, I.M.S., Capt. Rait, Punjab. Lieut. Finlayson, I.M.S.

Original Articles.

ANTI-MALARIAL MEASURES—ANCIENT AND MODERN

By H. HAMILTON, O.B.,

COLONEL, I.M.S.,

Hony Surgeon to the Viceroy

I HAVE been very pleased to read in the June number of the *Indian Medical Gazette* the reprint of the instructions issued by the Sanitary Commissioner, Madras, for the prevention of malaria. I am thoroughly in accord with him that the possibility of getting rid of malarial fever from any locality was by no means a matter of doubt to the sanitarian of former days, and that the measures directed against damp soil proved efficacious, if of sufficiently complete a nature. I am also well aware of the ridicule or the still worse "*odrum medicum*" that is directed against him who ventures to assert that soil and water may have something to say to the production of malaria. Whilst, however, it can be asserted with any approach to truth by such an authority as Lieutenant-Colonel King that 'as a result of measures against mosquitoes in all parts of the world the utmost that can be reported is that encouraging results have occurred', it seems to me that such ridicule might well be withheld. I know that Ismailia will at once rise to the lips of the champion of mosquito brigade operations. But the chief measures in Ismailia were drainage and filling up pools, and if it is claimed that the improvement effected is the result of the destruction of mosquitoes, then I must say that my experience going through the Suez Canal last December leads me to doubt it. Mosquitoes abounded everywhere, and particularly in the neighbourhood of Ismailia, and I was much struck by their aggressiveness during the day—no doubt stegomyia—whilst at night they made sleep impossible.

My first acquaintance with malaria on an extensive scale was in Quetta in 1879. This was when it was first occupied, and it was then a dry upland with very little water and very few trees. There was a small spring where we got our drinking water and a couple of nullahs with a little running water a considerable distance from the camp. There was one apricot grove affording but little shade as the trees were very old. By the beginning of June the whole ground was burnt and scorched by the powerful sun. In 1879 there were three showers in July, in 1878 the hot weather was rainless. I would not assert now that there were no mosquitoes, but before the connection between malaria and mosquitoes was proclaimed, I was in the habit of making that assertion. Their numbers, however, must have been very small as no one used mosquito curtains, those who had them

put them up by day to keep off the flies which were a veritable plague, but took them down at night. Colonel Wilson, of the Ordinance Department, has informed me that he was in Quetta in '83 and '84, and that neither he nor his wife nor a small child used mosquito curtains.

Last year, when I was on the Pindi manoeuvres, an officer who had been for a long time in the Political Department on that side, asked me how it was that there was much fever in places in Baluchistan where there were no mosquitoes! Now I am not asserting that this was the case, but, when assertions like this are possible about a place, it must be admitted that mosquitoes are not numerous in it, and seeing that Quetta, at the time I am writing about, was by far the most malarious place I have ever had the bad fortune to be stationed in, it does not harmonize with the theory that malarial fevers are in exact mathematical proportion to the number of anopheles. In fact I doubt if it would be possible to reduce mosquitoes in any place where they are numerous to anything like what they are in parts of Baluchistan where malarial fevers abound. In 1879, fifty per cent of all the troops in Quetta were in hospital during the autumn months, and every one who was there the year before said it was just the same that year. Now what has happened in Quetta? We have made gardens, we have brought in water, we have planted trees and have made the place altogether a fairly pleasant place for the anopheles, and gradually as we have done so malarial fevers have disappeared. It cannot be claimed that measures directed against the mosquito had anything to do with this, for the change had begun long before the anopheles had become a working hypothesis. I can see no way out of it except by supposing a change in the conditions of the soil. A very easy way out of the difficulty and the one usually adopted, by those who look on the anopheles as the only factor in connection with malaria, is to say that the fevers were not malarial. I can only say that all the fevers I saw, with the exception of a few quaitan, were the typical quotidian fevers of the text-books, with well marked cold, hot and sweating stages lasting a few hours one day and then passing off to return the next, each attack making the patient weaker and more anæmic. After four or five attacks there were usually some days without fever during which the condition improved, but in 99 cases out of a hundred the fever returned. In the course of time the fever lost the stages and assumed a low remittent form. This occurred in my own case. At first the fever was quotidian, but it became remittent during the next cold weather. I seem to have acquired a strong tendency to malarial fever in Quetta and have had a great deal ever since. About two years ago during an attack my blood was found to be "swarming with crescents and pigment." I think this disposes of the theory that the fever was not malarial. Another

argument might be that there were many anopheles that bit so quietly that they were not noticed and no other kinds of mosquitoes. I cannot argue, if a place of the kind—especially a place as arid as Quetta was then—is produced, I am convinced. But it would be very hard to persuade me that in a place like Ismailia, where mosquitoes are so much in evidence, anopheles are absent, or that in the arid but feverish part of Baluchistan, where mosquitoes are so little noticeable, anopheles are abundant.

Twenty-five years ago the people in the Quetta district knew perfectly well what was the cause of their fevers, and any one who dissented from their opinion was subjected to the same ridicule that a believer in other factors beside the anopheles is to-day. They said that all these fevers were due to chills and range of temperature, and that there was no such thing as malaria which was only another name for chill. In my annual report for 1885 written in the Quetta district, I tried to ridicule this idea. I pointed out that the upper end of the Kurram Valley had the same climate, range of temperature and opportunity for chills, but no fever. I said it was impossible that so well defined fevers could be due to anything but living germs. I predicted that these would one day be discovered, and that it would be found that the germs of the remittent and quotidian types were different. I looked on the quaitan as a very mild quotidian, and I thought a very severe quotidian infection capable of producing a remittent fever as I had seen, so many pass from the one to the other type. But those that began as remittents and remained such all through, I thought due to a different germ on account of their marked type and great severity. I did not know that Laveran was working out his great discovery, and that the world was already hearing of the plasmodium which was to put chills and other stupid heresies in their proper place.

It will be said that dampness of the soil cannot be alleged as the cause of the malaria in such a dry place as Quetta was at that time. I am quite ready to admit that. At the time I attributed the malaria to dampness in a very retentive soil containing much vegetable debris, the result of a rich growth of plants in the spring that dried down almost immediately. I am quite ready to admit that there was not much evidence of this dampness and that no one could have suggested surface drainage, and yet this theory saved a regiment I had charge of in 1885. It was in the Gwal Valley which receives the drainage of the Quetta Valley, and I selected the well drained sandy ground close to the Lora stream which had cut a bed for itself about 20 feet below the surface and acted as a natural drainage. On the 5th November, when going on furlough, I left 28 men or 4 per cent in hospital, and the agency surgeon told me that there were 30 per cent of the troops in Quetta in

hospital on that day and that a regiment in the Peshin Valley had only 50 men for duty.

In the year 1881 the 23rd Pioneers made a crucial experiment on the production of malaria by irrigation. This distinguished regiment went on the Afghan campaign from road making in the Simla Hills and consequently free from malaria and lost nine men from disease in the two years the campaign lasted. The twin regiment saturated with malaria in Quetta lost 80 men in three months! The 23rd arrived in Mian Mir from Afghanistan on the 6th October 1880, a very malarious time of the year. I well remember the enormous numbers of mosquitoes there were and how we were bitten by them as we had no mosquito curtains, and it hardly seemed worth while getting them so late in the year, but no one, officer or man, got fever. The lines were bare of trees, and it was determined to remedy this. A canal cut ran up close to the lines only separated from them by the breadth of a road. This was prolonged under the road, a Persian wheel was erected, holes were dug for trees and irrigation on a very extensive scale within the lines was begun. The result of this was that the men began to come into hospital in the following July, and by the beginning of November the whole regiment was disorganized. On the 15th November I inspected the regiment and found only 50 men fit for service.

At this period the then Sanitary Commissioner with the Government of India with all the weight of his position and all the force of the most polished English asserted year after year that irrigation never did any harm!

After the experience recorded I could not accept this, and recommended that all the gardens the men had made should be stopped, that the trees should be sparingly watered till the rains, that after that all watering for the year should cease. The year 1881 was a fairly good year in the rest of the station and in the Punjab generally. I was informed by a canal engineer that in 1882 there were whole villages in which there was not a single man to look after the crops during the autumn. Malaria was fairly bad in Mian Mir, but the 23rd Pioneers suffered very little more than the other native regiments. The next year men were sent out after each fall of rain to run off all collections of water, and the following year when the regiment left for the Hurrai on the 28th October, it left only eight men in hospital all told. It must be remembered that the huge excavations that now exist in these lines had not then been made, otherwise such good results could not have been achieved.

Now I ask could the sickness of 1881 have been induced except through the soil or could it have been arrested by attacking the mosquito instead of the soil. Sierra Leone was the first place where malaria was attacked through the mosquito and the most tremendous results were claimed. But Dr Plout, the P M O, in a letter to the *B M J* in 1903, was very sarcastic about

them, and in the *R A M C Journal* of March this year Majors Smith and Peaise write—"The continued prevalence of fever at Tower Hill is somewhat of a disparaging commentary on the results claimed in Free Town by mosquito brigades" In the June number of the same journal, page 828, it is stated in a review that—"It has yet to be proved that diminution of sickness in the place mentioned (Sierra Leone) has resulted from the special anti-malarial operations of the Liverpool School—and the 'claiming of results before they are due' is deprecated"

A couple of years ago extensive mosquito brigade operations were described in this journal from Port Blau—with "encouraging results"—it is always a good thing to be encouraged by very modest results such as were described

Let us look for a moment at the fevers generated by turning up the soil Most people sneer at this now Major Hoddeis RE, in a pamphlet describing his work in Santa Lucia does, and then goes on to explain it by saying fresh earth attracts mosquitoes! Manson who knows China does not, and no one that I ever met in Hong Kong attempted to deny the fact They attempted to explain it by saying that puddles were formed in which mosquitoes bred I can only say from what I saw of the disintegrated granite of Hong Kong that they would be ingenious workmen who would so arrange it that it would form puddles Moreover in such a wet climate the anopheles have no difficulty in finding places to breed

It is well known that England was once as malarious as India is to-day What has brought about the change? Not the destruction of the anopheles—Major Ross tells us they abound in the neighbourhood of Liverpool Not the universal use of quinine—the change began before quinine came much into use It can hardly then be anything else than the change wrought in the soil by drainage and cultivation

The Campagna drained and inhabited by the Romans is another case in point, and so for the matter of that is Major Hoddeis' case in Santa Lucia So far as we can judge from the results hitherto obtained, the important thing in the prevention of malaria is drainage, measures directed against the mosquito being of secondary importance By drainage I mean drainage in the broadest sense of the term—the prevention of irrigation—the prevention of excavations—surface and subsoil drainage, the removal of jungle and crowded bushes, &c, the sun should be able to reach every bit of ground at some time of the day Well-grown trees allow of this Every tree in a military station should be like a tree in an English park—not a miserable thing crowded out by half-a-dozen others more miserable than itself No excavation should be allowed within a mile of barracks Contrary to the teaching of the mosquito brigade operator who says it is enough if you fill up excavations with earth, sand, rubbish, anything that comes in your

way, I say that no excavation should be allowed because it is practically impossible to fill up an excavation so that it won't hold water for years The loose earth in an excavation sucks up water like a sponge and retains it

As is well known an important experiment was made in Mian Mir two years ago

This consisted in the usual measures directed against the mosquito, in a fairly distinct quarter of the station, under the orders of men with the reputation of experts, combined with the prophylactic use of quinine not confined to that quarter The result is now matter of history

A much more important experiment is now being carried on This consists in what I have described above as drainage in its broadest sense combined with measures directed against the mosquito and the prophylactic use of quinine If the experiment is a success it will be fairly easy to assign to each of its component measures its proper share in the result by looking back to 1903 But I hope no hasty conclusions will be drawn It will take a few years to formulate results Inexperienced medical officers are already drawing conclusions, forgetting that the fever season in the Punjab is as strictly limited to the autumn as the mushroom season in England, and that in the absence of rain there may be practically no fever, as was the case in 1902, the year the malaria commission began its operations in Mian Mir I will say no more about an experiment that is still in progress, and one that I hope will decide one of the most important questions of the day

In conclusion, I would make a quotation from Sir M Foster's article on plague—"The commission of 1898 did some good work, but it was too bacteriological in its character and had not a single member who could be called an epidemiologist What was wanted and is still wanted, is a study of the whole question on the spot by men skilled in the study of epidemics and expert in the methods of suppressing them"

This is very largely true of the recent attacks on malaria, and I hail with great satisfaction the entry on the scene of a distinguished practical sanitarian like Colonel King

TWELVE CASES OF SNAKE-BITE TREATED BY INCISION AND APPLICATION OF PERMANGANATE OF POTASH, WITH TEN RECOVERIES

BY LEONARD ROGERS, M.D., F.R.O.P., F.R.C.S., I.M.S.,
Acting Professor of Pathology, Medical College, Calcutta

In the *Indian Medical Gazette* of September 1904, a paper by Sir Lauder Brunton, Sir Joseph Fayrer and myself was reprinted from the Proceedings of the Royal Society of the same year, in which a method of treating snake-bites, first proposed by Sir Lauder Brunton, and experimentally proved to be efficient against all classes of snake venoms by myself, was advocated In

the issue of February 1905, five cases of the successful application of this method collected by me were published. Since that time the "Snake Lancet" has been sold in India in considerable numbers, several thousand having been distributed by one firm alone, and in accordance with a request made in the printed instructions sent out with each lancet that reports of all cases treated, whether successfully or not, may be sent to me, several reports have reached me which appear worthy of analysis. In order that the results may be easily grasped without a laborious study of lengthy notes, I have embodied the main features in the accompanying table. As it is of the utmost importance to know if there is clear evidence of the patient having been really bitten by a poisonous snake, supplementary information has been obtained by correspondence with the reporters whenever necessary, and in the first part of the table those cases in which the snake which inflicted the bite was killed or caught and identified are given,

of those in which the variety was identified it was a cobra. This is a satisfactory feature of the cases, for the cobra is much the most deadly of the more common poisonous snakes of India, the average amount of venom obtainable from them being ten times the fatal dose for a full-grown native, though fortunately they do not always inject their full quantity for various reasons. In only one of this series was it noted that the snake was a small one, namely, in No 8, in which it measured only $1\frac{1}{2}$ feet, but it is known that even a cobra of this size may inflict a fatal bite, although it is less likely to do so than a full-grown snake.

Number of fang marks—In case 1 the patient was stated to have been bitten three times on the arm by the Russell Viper, and the ligature had to be applied just below the amput, yet the patient recovered. In case 10 only one fang mark was found, but in all the others in which this point was noted two fang marks were distinct, showing that the snake must have been a

Table of Cases of snake bite treated by the Permanganate Method

No	Caste	Sex	Age	Snake	Fang marks	Site of Bite.	Time of treatment.	Time bitten	Result
<i>Cases in which the snake was killed and identified</i>									
1	N	M	Ad	Russell Viper	2	Arm	At once	Day	Rec
2	H	M	30	Cobra	2	Foot	4 hour*	Evening	"
3	H	F	40	Cobra	—	Forearm	11 hours	Midnight	Died
4	H	F	Ad	Russell Viper	2	Foot	1 hour	Morning	Rec.
5	H	M	Ad	Cobra	2	Toe	4 hour	9 P M	"
6	H	M	Ad	Cobra	—	?	At once	? Day	"
7	H	F	Ad	Cobra	2	Foot	4 hours	?	"
8	N	M	Ad	Cobra (small)	2	Toe	1 hour	Afternoon	"
<i>Cases in which the snake was not killed</i>									
9	H	F	35	Cobra (seen)	2	Finger	4 hour*	10 A M	Rec
10	H	F	Ch	? (black)	1	Finger	At once	Noon	"
11	M	M	Ad	?	2	Foot	Soon	10 P M	"
12	M	F	Ad	?	—	?	9 hours	3 A M	Died

* = Ligature applied at once Ad = Adult Ch = Child. H = Hindu. M = Mahomedan

while the doubtful cases are grouped separately in the second part of the table. The part of the body on which the bite was inflicted, the number of fang marks, and the time after the infliction of the bite when the treatment was commenced are all entered in the table.

An examination of the cases shows the following main points of interest—

Nationality—All the patients were natives of India except No 1, who was a native cook treated in a remote part of Siam by a European without medical training. No 8 was also treated by a non-medical European, both cases being successful, so that it is clear this method can be safely and efficiently carried out by any intelligent person in an emergency.

Sex and age—The cases were equally divided between the two sexes, and all but one patient was in adult life.

Kind of snake—In two cases the bite was inflicted by a Russell Viper, and in the rest

poisonous one, and also making it very probable that the bite inflicted was an efficient one.

Position of the bite—This is an important point to note, for if the fangs strike a portion of the body where there is only a very thin layer of tissue covering bone, as on the back of the fingers and toes, then they may not penetrate sufficiently deeply to allow of the whole of the venom entering the tissues, and some of it may escape on to the surface of the skin, and consequently a fatal dose may not be received. This is less likely to occur in the case of the cobra than with viper, both on account of the small size of the fangs and the close proximity of the place of escape of the venom to the tip of the fangs, and also because this snake commonly emits several times a fatal dose. Nevertheless, it is necessary to point out that in four of the cases tabulated above the bite was on a finger or toe, and in four more on the foot, these being the commonest places for snake-bites to be received,

especially in the case of cobras, which can only strike downwards. It is possible then, that the bites in some of these cases would not have proved fatal even if they had not been efficiently treated with the local application of permanganate of potash, still the fact remains that ten out of the twelve cases recovered, and that the two deaths occurred in cases which were not treated until nine and eleven hours, respectively, after the infliction of the bite, when the patients were moribund, a fatal dose of the venom having doubtless already entered the circulation beyond the reach of local treatment.

Time after the bite when the treatment was commenced—This is a point of the greatest possible importance, and regarding which experience is most wanted. In my earlier papers I was careful not to over-estimate the value of this method of treatment, but stated that it "may be expected to save the lives of persons bitten by other than large cobras and very large kraits if the treatment is carried out within from fifteen to thirty minutes", but in the case of the two mentioned it would have to be begun very quickly to be certain to save life. This estimate appears to be more than borne out by the series of cases now recorded, which include all I have notes of up to the date of writing. Thus, in only four of them was the treatment commenced at once, and even in three of these a native medical man or other person with a snake lancet had to be summoned to the spot, which could scarcely have taken less than fifteen minutes. In No 1 the patient was in a tent close to the operator. In three other cases a full half hour elapsed before the treatment was commenced, but in two of these a ligature had been applied shortly after the infliction of the bite, which would at once check the absorption of the venom and allow of successful treatment at later period than would otherwise be the case. In three other cases, however, in which no ligature had been applied until the patients came under treatment $\frac{3}{4}$, 1 and 4 hours, respectively, after the infliction of the bites the treatment still proved successful in saving the life of the patients, although some sloughing the wounds due to the action of poison resulted. No 7 is a specially noteworthy case, for the patient was not treated until "about 4 hours after the bite, and when brought under treatment poisonous symptoms were fully developed. The two fang marks on the upper and outer side of her left foot were very distinct. The patient was drowsy and delirious, restless and her talk incoherent, and the bitten limb benumbed." How far some of these symptoms could be explained as due to fright I am not prepared to say, but that the case may have been one of genuine cobra poisoning, and that her life may have been saved by the permanganate treatment (which was combined with injections of ether and strychnine), I am led to believe by the following considerations. In the first place, experiments on animals with cobra venom show

that when slightly less than a fatal dose is given, symptoms appear after a long incubation period, usually eight to twelve hours, and extreme paralysis and the typical affection of the breathing ensue, but after lasting many hours, complete recovery may eventually take place. Secondly, in my experience, if marked symptoms appear within four hours of the injection of cobra venom, death always takes place. In the case under consideration, then, it is highly probable that a fatal dose had been injected into the patient's tissues by the cobra, as it produced such marked symptoms within four hours, but that less than a fatal dose had entered the circulation, and the remainder, being still unabsorbed in the wound, was destroyed by the permanganate, and the patient's life thus saved. I am indebted to Dr Protap Narain Singa, L.M.S., for the notes of this case as well as of Nos 2 to 6, and to the Agency Surgeon, Eastern Rajputana States, for Nos 9 to 11.

Time of infliction of the bite—It is interesting to note that the cases which occurred in the day-time were most promptly treated, and next those which took place in the evening. On the other hand, in the two fatal cases, the bite occurred at midnight and 3 A.M., respectively, and the treatment was delayed until the next day, when it was too late.

Taking these cases as a whole, they are very encouraging, especially considering that no anti-venene was used in any of them, simply because none was available, and they justify the hope that, as the treatment becomes more and more widely known that some definite effect on the mortality from snake-bite in India will be produced. Arrangements have now been made for the manufacture of the snake lancet in Calcutta by Dr K. C. Bose, Bengal Pharmaceutical Chemist, 91, Lower Circular Road, Calcutta, who hopes to be able to sell them at the very low price of two annas each, with instructions printed in Hindustani or Bengali as required.

A REPORT ON THE EPIDEMIC OF PLAGUE IN HUGHLI-CHINSURA MUNICIPALITY JANUARY TO MAY 1905 [ABRIDGED FROM AN OFFICIAL REPORT]

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Plague first appeared in Bombay in the summer of 1896. Calcutta was attacked in May 1898, but the disease did not seriously affect the city in that year, dying out in September. Plague reappeared in Calcutta in February 1899, and since then has never been entirely absent, and has been epidemic every year from February to May.

To the best of my belief, no town nor district in Bengal, outside the cities of Calcutta and Howrah, with their suburbs, had suffered from an epidemic of plague, until the towns of French Chandarnagar and Hughli

Chinsura were attacked by the disease in the beginning of 1905. Bihar has, as is well known, suffered severely, but Bihar, both geographically and physically, is more akin to the United Provinces than to Bengal.

There have also been many small localized epidemics in Bengal, cases where a man suffering from plague has gone from Calcutta to his home in a mofussil village, and has introduced the plague, but in such instances the disease has hitherto always died out after causing a few deaths in the infected place, and has not recurred.

One such small localized epidemic occurred in this district in 1900, when a man suffering from plague came from Calcutta to the village of Kristapur, in Arambagh Thana, on 9th April, and died there, eleven other cases occurring in the village between that date and 5th May. Only one of the whole twelve cases recovered. This is the only instance of the sort which has occurred in this district.

Plague first appeared in Hughli in 1899. Exclusive of the Serampur Sub division, which is under a separate Civil Surgeon, and the statistics of which do not pass through the office of the Civil Surgeon of Hughli, 153 cases in all have occurred in Hughli District, in the six years 1899 to 1904 inclusive, an average of 25 yearly. In 1899, 1900, and 1903, there were a certain number of local cases infected from imported cases. In 1901, 1902, and 1904, all the cases which occurred were direct importations from infected localities. The figures for the six years are tabulated below.

TABLE NO I
Statistics of Plague, Hughli District,
1899 to 1904

YEAR	HUGHLI CHINSURA.			SADAR SUB-DIVISION			ARAMBAGH SUB-DIVISION			TOTAL		
	Died	Recovered	Total	Died	Recovered	Total	Died	Recovered	Total	Died	Recovered	Total
1899	13	5	18	1		1	2		2	16	5	21
1900	31	14	55	2		2	18	1	19	51	15	66
1901	13	1	14	3	1	4	1		1	17	2	19
1902	4		4	6		6	5		5	15		15
1903	8		8	4		4	6		6	18		18
1904	5		5	2		2	6	1	7	13	1	14
Total	74	20	94	18	1	19	38	2	40	130	23	153

The first case of plague in 1905 occurred in a Hindu rice dealer, aged 65, who lived in British Chandarnagar, Ward VI, about a quarter of a mile from the French boundary. He kept a grain shop in Lakhiganj, in French Chandarnagar, to which he went daily. He came home on the evening of 7th January, suffering from fever, developed a large bubo in the left groin, and died on the evening of the 13th. I received a report of the case on the morning of the 14th and went to enquire about it. I disinfected the house, all deceased's bedding and clothing was said to have been burned with his body. I was informed by the neighbours that plague had appeared in Lakhiganj, and that he had probably contracted the disease there. I wrote the same day to the Medical Officer of the French Settlement to inform him of the case, and the same day received a letter from him stating that plague had broken out in Lakhiganj. No other cases followed this one in British Chandarnagar at this time.

On the morning of 1st February I was asked to go to see an elderly native medical practitioner, who was very ill. I did so at once, and found him suffering from symptoms of angina pectoris. While I was there,

another practitioner came in and told me that the patient had recently attended two fatal cases of pneumonia, which were probably cases of pneumonic plague. The patient died the same day, but, even in the light of subsequent events, I do not think that this was a case of plague, he showed no symptoms of any variety of plague. No case of plague occurred afterwards in his house, nor among his relatives, nor in the vicinity of his house.

From this patient's house I went at once to enquire about the fatal cases of pneumonia he had attended, and discovered the following facts—A Hindu, aged 60, named Ishan Chandar Shaha, who lived at Rai Bazar, Bahi, Ward I, and had a shop in Hughli Chaak, Ward II, was attacked by pneumonia at Rai Bazar on the 19th January, and died on the 22nd. I could not ascertain whether he had recently been to Calcutta or not, and I may here say that I never succeeded in getting any clue to the origin of this series of cases of the disease. His daughter and son-in-law nursed him, the latter fell ill on the 26th, went with his wife to his father's house in Kamarpara, Ward V, and died there on the 28th of pneumonia. His wife fell ill on the 30th.

On the 1st February, about 11 A.M., I visited this house in Kamarpara, and found the wife suffering from pneumonic plague, and moribund, three other cases of the same disease in the house, and two others evidently sickening. In the house at Rai Bazar I found two persons ill, a young man and an elderly woman, the latter Ishan Chandar Shaha's widow. Both of them died on 3rd February, the house was disinfected, and all bedding and clothing in it of every description was burned, making a bonfire about six feet cube. No further cases occurred in this neighbourhood at this time.

The five cases seen in the house in Kamarpara were all dead within three days. As each patient died the room occupied was disinfected, and all bedding and clothing burned. Several of the other occupants of the house, of whom there were many, removed to other houses in the neighbourhood, taking plague with them, until 17 cases in all had occurred, counting both houses, that in Rai Bazar and that in Kamarpara. Fifteen of these cases died here. Two were taken to Calcutta, the widow and child of one of the early cases being removed by the widow's father and mother, who came from Calcutta to see them, and took them away without my knowledge. I subsequently heard from the relatives that all four, father, mother, widow, and child, had died in Calcutta. As this unfortunate family moved from house to house, taking plague with them, I visited them daily, and disinfected each house, burning bedding and clothing, as the patients died. The last case of this series, a young woman, was deserted and left alone in a house, from which she had to be removed to the hospital, where she died next day, 15th February. This was the end of this particular strain of the disease. All contacts were kept under observation for fourteen days from the date of death of the last case, and all remained well, nor did any others of this family suffer during the three months more that plague persisted in the town. All these cases were *pneumonic plague*.

The next cases of plague were two Musalman children, a boy of 12 and a girl of 8, living in Pankatoli, in Ward II, who were attacked with *bubonic plague* on 11th February. No history of exposure to any previous infection could be got. It is most unlikely that these Musalman children could have had any communication with the family previously attacked, who were Hindus of the Suri caste. Pankatoli, where these two new cases occurred, is fully a mile from Kamarpara and Rai Bazar, where all the former cases had occurred. These two places are fully two miles apart, and Pankatoli is just half-way between. The boy recovered, the girl died. The only subsequent case in this neighbourhood was the girl's father, who fell ill 14 days after his child's death, and died on the sixth day.

Two new cases occurred in British Chandarnagar, on 18th and 19th February, more than a month after the death in that quarter of case No 1. The first of these cases also got the infection in Lakhiganj, where by this time plague had thoroughly established itself. Two cases in Ward II and one in Ward VI then occurred, without any source of infection being traceable. The next two cases after them came from French Chandarnagar actually suffering from plague, as did also two more not much later.

After 19th February cases in British Chandarnagar began to occur frequently, and this quarter suffered severely up to the end of March. In April and May Ward II, Hughli proper and Bali, were chiefly affected. The epidemic in Ward II started in the Mogulpura *basti*, just west of the Imambara buildings, the first case being a Musalman who came from Calcutta, suffering from plague, on 6th March. This man's widow also subsequently died, but no connection was traceable between him and the second case in this quarter, a young Hindu woman who was eight months pregnant.

This ward suffered more severely than any other with the exception of Ward VI, contributing just thirty per cent of the total cases. There were 76 attacks, 72 local and four imported, with 57 deaths and 19 recoveries. The parts which suffered most severely were the Mogulpura *basti*, just in front of the Imambara buildings, into which plague was imported from Calcutta in the first instance, and Boral Lane, Bali, with the lanes immediately adjoining it. No connection could be traced between the plague in this ward and the previous cases in Wards I and V.

Ward III lies south of Ward II, comprising Gutia Bazar, Pipalpat, Babuganj, &c. This ward suffered little from plague, there were only thirteen cases, of which five were imported, with four recoveries and nine deaths. Three of the four last cases occurred in this ward. The jail, containing over 400 prisoners, stands in Ward III, and fortunately escaped. Gutia Bazar, a very thickly populated urban block, immediately south of the jail, also escaped entirely, with only one imported case, which recovered.

TABLE NO II

Incidence of Plague on the six Wards, Hughli-Chinsura Municipality, 1905

No	WARD	POPULATION	ORIGIN			RESULT			TYPE				RATIO PER 1,000 OF POPULATION	
			Imported	Local	Total	Recovered	Died	Total	Bubonic	Pneumonic	Indefinite	Total	Cases	Deaths
I	Shahganj, Bandel, &c	2,898	2	14	16	4	12	16	5	6	5	16	5.17	4.14
II	Bali Hughli proper	5,915	4	72	76	19	57	76	43	15	18	76	12.84	9.63
III	Gutia Bazar, Babuganj, &c	5,220	5	8	13	4	9	13	10	2	1	13	2.49	1.72
IV	Bara Bazar, Dharmpur, &c	4,440	1	3	4	1	3	4	2	1	1	4	0.90	0.67
V	Chinsura proper	6,067	2	39	41	7	34	41	16	16	9	41	6.75	5.60
VI	British Chandarnagar, Kankasali, &c.	4,638	7	97	104	15	89	104	59	31	14	104	22.42	19.18
TOTAL		29,178*	21	233	254	50	204	254	135	71	48	254	8.67	6.99

* Add floating population (in boats), not counted as belonging to any wards, 205, total population at census of 1901, 29,383

Table No II gives the incidence of plague on the six wards of the town showing the population, the number of imported and of local cases, of fatal cases and recoveries, of cases of various types of plague, and the rate of attack and death-rate, for each ward separately.

Ward I, comprising Shahganj, Bandel, Keota, and part of Bali, is the most northerly part of the town, and consists of a thickly populated urban block at its southern end, Bali, adjacent to Ward II, north of which lies a thinly populated tract, with a large village, Shahganj, at the extreme north. The plague broke out at Rai Bazar, in the south of this ward, in January, as described above. There were, however, only sixteen cases in all in Ward I throughout the epidemic, two imported and fourteen local, with four recoveries and twelve deaths. Out of these sixteen cases, thirteen occurred in the extreme south of the ward, closely adjacent to Ward II. Of the other three cases, two were imported from French Chandarnagar, and the third, though local to the town, was imported into Ward I from Ward III. The greater part of this ward, therefore, remained free from plague.

Ward II lies south of Ward I, and comprises Hughli proper, the Chauk, &c, with the greater part of Bali

Ward IV, south of Ward III, contains Bara Bazar, a crowded street, with Mogultoli, Malik Kasim's Hat Khagrajoli, and Dharmpur. This ward almost entirely escaped, only four cases were reported, with one recovery and three deaths. One of these cases was sent to the Imambara Hospital from Bhatpara, on the other side of the river Hughli, another case was imported into Ward IV from Ward VI.

Ward V is Chinsura proper, and is the most densely populated ward. It contains the old barracks, now used as court houses, and the small Chinsura *maidan*, with the crowded quarters of Kharna Bazar, Kamarpara, and Chaumatha. This part of the town is wholly urban, and is the oldest quarter, great part of it dating from the Dutch times. This ward was third in order of mortality, with 41 cases, 39 local and two imported, 34 deaths and seven recoveries. It contributed sixteen per cent of the total cases, out of the whole 41 cases, fourteen, or just one third, occurred in the first outbreak of pneumonic plague described above.

Ward VI is the most southerly of the six wards in the town, it comprises Kankasali, Taldanga, and British Chandarnagar. The French settlement lies immediately south of it, the boundary being for some distance a

small road, fifteen feet wide, and partly a mere footpath, three feet wide. This ward suffered far more severely than any other, especially throughout the month of March, with 104 cases, over two fifths of the whole, 87 local and seven imported, 15 recoveries and 89 deaths. The plague was undoubtedly imported into this ward through French Chandarnagar, which was first attacked, and the whole ward was thoroughly infected.

The results which are tabulated in Table No II may be briefly stated as follows —

Imported cases	5	recovered,	16	died, total	21
Local	45	"	188	"	233
Total	50		204		254

Of the 21 cases imported, ten came from French Chandarnagar, with three recoveries and seven deaths, nine from Calcutta, with two recoveries and seven deaths, one each from Bhatpara and Titagarh, both fatal.

As regards the type of the disease, there were 71 pneumonic, 135 bubonic, and 48 more or less indefinite, the patients not having any symptoms of disease in the chest, and no enlargement of glands distinguishable by external touch. Many of these cases died very rapidly, in fact, they died before they had time to develop any well-defined symptoms of the disease. A few cases were said to have proved fatal within 24 hours, though I did not hear of any cases of actually sudden death, in a person supposed to have been in health up to the time of death, such as those which have recently been reported in the press. Many of these indefinite cases were not seen in life by any of the plague staff.

I may here mention that, out of the total of 254 cases, I saw personally 151, while 61 were not seen in life by any of the plague staff, but were reported after death as cases of plague, or included in the list of cases from the account of their symptoms as described by others. Some of these cases were reported by qualified practitioners, but many of them were not seen alive by any one competent to form an opinion.

The diagnosis of a well marked case of bubonic, or even of pneumonic plague, presents no difficulty, but it seems to me far otherwise in the indefinite cases, especially in those which die very rapidly, before symptoms had time to develop, and there must always be a good deal of guesswork involved in the diagnosis of a case which has not been seen alive by any competent person, from the description of friends or neighbours, who are not likely to be accurate observers, and may have their own motives for giving information which is designedly incorrect.

I was much struck with the enormous quantity of bloody sputum coughed up by some of the sufferers, especially in the first outbreak of pneumonic plague in Bali and Kamarpara. This sputum was not rusty, like that of pneumonia, but partly of a bright red and partly of a bright white colour, mixed together, it was intensely viscid, and in two cases the whole floor round the patient was shiny with dried sputum. The numerous cases which occurred in Kankasali, in Ward VI, were also mostly of the pneumonic type. Cases in which definite signs of lobar pneumonia developed, though several such proved fatal, were usually not cases of plague, as far as I could judge, and were not returned as such, unless they occurred in close connection with cases of undoubted plague. The highest temperature recorded in any case was 106.8, in a boy, four hours before death. I took this temperature myself.

The indefinite cases, with high fever and delirium, but without definite signs of lung disease or enlargement of glands, were usually called by the people cases of *jwar bikar* জ্বর বিকার, i.e., fever without sense, or fever with delirium. This is interesting, in that *jwar bikar* was the popular name in universal use to describe the great epidemic fever of 1857-1877, usually known as the "Bardwan fever."

The site of the buboes in the 135 bubonic cases may be tabulated as follows —

TABLE No III—Site of Buboes

	Right	Left	Both	Total	Recover- ed	Died	Total	Percent- age of total number
Cervical	10	11	3	24	8	16	24	17.77
Axillary	11	6	3	20	7	13	20	14.81
Femoral	12	20	7	39	11	28	39	28.88
Inguinal	10	20	3	42	9	33	42	31.11
Multiple				9	4	5	9	6.66
Not noted				1		1	1	0.73
TOTAL	52	57	16	135	39	96	135	99.98

Those noted as cervical include parotid, submaxillary, anterior and posterior cervical glands. In some cases the neck was so swollen that it was not possible to ascertain in which glands swelling had originated.

It is rather curious that the multiple cases gave the highest ratio of recovery. These cases were as follows —

- (1) Male, left femoral and left inguinal, recovered
- (2) Female, left femoral and left inguinal, recovered
- (3) Male, right femoral and right inguinal, died
- (4) Female, both femoral and both inguinal, died
- (5) Female child, left femoral and both inguinal, died
- (6) Male, both cervical and right axillary, recovered
- (7) Male, both cervical and right femoral, died
- (8) Female, right axillary and right inguinal, died
- (9) Female, right parotid and left inguinal, recovered

Since sending in the official report, it has been suggested to me that it would probably be found that a great majority of the femoral and inguinal cases of glandular swellings would be found to be males, of axillary swellings females. I have accordingly constructed a table showing the sexes of the cases in which the various glands were implicated, but it hardly bears out the above suggestion. The numbers of the two sexes, excluding children under ten years of age, whom I have shown separately, vary but little.

TABLE No IV—Sexes of Bubonic Cases

	MEN			WOMEN			CHILDREN			TOTAL		
	Recovered	Died	Total	Recovered	Died	Total	Recovered	Died	Total	Recovered	Died	Total
Cervical		3	3	3	8	11	5	5	10	8	16	24
Axillary	2	6	8	2	7	9	3	7	10	3	7	20
Femoral	13	16	29	1	10	11	5	12	17	11	28	39
Inguinal	4	16	20	2	16	18	3	1	4	9	33	42

In only twelve cases did the glands go on to suppuration and require incision, and ten of these twelve recovered. Not that suppuration is in itself a favourable sign, but that only cases which live long enough to be in a fair way to recovery, as a rule, give time for the glands to reach the stage of suppuration. One of the two fatal cases lived to the nineteenth day, the other died on the sixth day.

The incidence of the disease, according to sex and age, is shown in the accompanying table. But ages of native patients are, to a considerable extent, guess work.

TABLE No V—*Age and Sex*

	MALE			FEMALE			TOTAL		
	Recovered	Died	Total	Recovered	Died	Total	Recovered	Died	Total
1-5		5	5	6	3	9	6	8	14
5-10	11	4	15	5	10	15	16	14	30
10-20	7	17	24	2	14	16	9	31	40
20-30	2	22	24	6	24	30	8	46	54
30-40		7	7	3	15	18	3	22	25
40-50	1	15	16	2	14	16	3	29	32
Over 50	3	16	19	2	38	40	5	54	59
TOTAL	24	86	110	26	118	144	50	204	254

There are some curious results in the above table. The only age periods which show no recoveries are males under five, and males of 20 to 30, the latter men in the prime of life, just those in whom one would expect the best recovery rate. While all the male children under five attacked died, out of nine female children under five attacked, six, or two thirds, recovered. On the contrary, out of fifteen male children from five to ten attacked, eleven, or nearly three-fourths, recovered, of female children of the same age exactly two thirds died. The very large proportion of old persons, over fifty, attacked, especially old women, and the very high mortality among them, are also striking. Women over fifty contribute almost one sixth of the total number of cases, and almost one-fifth of the total number of deaths. The oldest cases were a male of 77, and a female of 75, the youngest two males of one and one and a half years, all four Hindus, and all fatal. The number of females attacked, 144, was considerably higher than that of males, 110, and the mortality among females was also somewhat higher, while the total population of the town shows a somewhat larger number of males, 15,378, against 14,005 females. That the number of cases and deaths among females should be larger than among males is, I believe, the usual experience in a plague epidemic. It is probably due to the fact that plague is a local disease, infecting the soil of the affected locality, and thus being more likely to attack females, who spend a much larger proportion of their time in doors, than males.

The incidence of the disease according to race was as follows—

TABLE No VI—*Race*

	Re covered	Died	Total	Percentage of Recoveries
Hindus —	41	184	225	18.21
Musalmans	9	20	29	31.03
TOTAL	50	204	254	19.68

It will be seen that only 29 Musalmans were attacked, and the death rate among them was just over two thirds, while among Hindus the death rate was over four fifths. The first one hundred cases included only four Musalmans, and no Musalman woman. I am unable to get any statistics showing the numbers of Hindus and Musalmans, respectively, in the town, but Hindus are in a very large majority.

Caste—I cannot say very much about the castes of the patients, as no special notes were kept on this point, beyond noting the names of the sufferers. The family among whom occurred the first outbreak of pneumonic plague were Suris, the caste who sell liquor, though

none of this particular family were engaged in their hereditary occupation. Among them there were sixteen cases, all fatal, the seventeenth being a maid-servant, a Bagdi by caste. Of Brahmans 26 were attacked, ten males, of whom two, both boys, of between five and ten years of age, recovered, and eight died, and sixteen females, who all died. It is possible that some other cases may have occurred among Brahmans, whose caste was not noted at the time. In the beginning of March four persons of the dhobi caste, two men and two women, died of pneumonic plague, probably caused by washing infected clothes, though this was not ascertained with certainty. All belonged to one family, and no other dhobis were attacked.

Disinfection—The houses of almost all the fatal cases, and of many of those who recovered, were disinfected, the clothing and bedding of the sufferers, or as much as the other residents of the house would admit to be there, being burned at the same time. As a rule, one is told that most or all of the bedding and clothing of the deceased has been sent to the burning ghat with the body. But usually a good deal of bedding and clothing was handed over by the relatives to be burned, especially after the people had been alarmed by the heavy mortality from the disease. In some cases I was informed, at well-to-do houses, that all which had not been burned had been thrown away. This of course implies that the articles thus thrown away, if not quite worn out and useless, are picked up by poorer persons, and spread the disease. In a great many cases, however, clothing and bedding was found outside the house soon after death, and was at once burned. This work was done by the Assistant-Surgeon, Babu B. K. Chaudhri, and by myself, until the two native doctors engaged for special plague duty joined, afterwards by them. Compensation for bedding and clothing destroyed was paid by the municipality to the poor.

The disinfectants used in all cases were perchloride of mercury and strong hydrochloric acid, two ounces of each to three gallons of water, i.e., double the strength originally prescribed. The mixture was applied in the form of a spray through an ordinary garden syringe. In addition to the actual disinfection of the houses of the sufferers in this way, the municipality did a good deal of disinfection of drains and lanes with lime and phenyle. These were also used to a considerable extent by well-to-do persons.

As regards the attitude of the people to disinfection, there was practically no opposition. In only one case did the people of a house in which a plague death had occurred actually refuse to have it disinfected. In a few cases disinfection could not be carried out because all the survivors had fled, locking up the house before they left, though in one or two such cases the infected house was found open again, and disinfected, later on. In many cases the residents of the house disinfected, though not actually objecting, seemed to look upon the whole business as an unavoidable nuisance. In other cases, they expressed themselves as most grateful, and some eagerly applied for disinfection. This was especially the case in the latter half of the epidemic, when rats were dying. Numerous applications were received for disinfection of houses in which rats had been found dead, and in all such cases disinfection was carried out.

A question which must force itself upon every one who has had experience of an epidemic of plague is, whether disinfection, as carried out, is of any real practical use. It must be admitted that, to get the full benefit of disinfection, removal and isolation of the sufferers is also necessary. If every case of plague, on occurrence, could be removed to a hospital for infectious disease, along with all his belongings and, still better, if all contacts could also be segregated for ten days or so, then disinfection would be a valuable measure, and isolation and disinfection together, enforced when the disease first appeared, would readily stamp it out. By such measures plague has rapidly been exterminated in the many places into which it has been imported in

the British Isles, Glasgow, Cardiff, Bristol, &c. But to carry out such a policy it is necessary to have, not only the passive approval, but the active co-operation of the people, and this is impossible in India. It has long been recognised that any active plague policy in this country will do more harm, by arousing the opposition of the people and thus leading to concealment of cases, than it can possibly do good.

Granted that isolation in hospitals is impracticable the next best thing would be isolation in the sufferer's own house. In a few cases this was fairly well carried out, by people who were both well-to-do and enlightened. But few of the sufferers had the necessary means, or the necessary accommodation in their houses, to carry out private isolation, and still fewer had the enlightenment necessary to see the advisability of such a step. In most cases the patient remained in the midst of his family, relatives and neighbours keeping up the most full and free intercourse with him till his death or recovery, after which disinfection was carried out.

Obviously it is of no use to disinfect a house or room while the patient still remains in it, a more dangerous source of infection in himself than any of his inanimate surroundings can possibly be.

As regards the results achieved by disinfection, on paper they appear to be good. It certainly seemed as if the first outbreak of pneumonic plague was killed out by repeated disinfection. After the seventeenth case none of the other contacts, relatives or neighbours, got the disease. This strain of plague appeared to have been stamped out. The subsequent importation of plague into Ward VI from the south had nothing to do with this outbreak, but occurred quite independently of the first.

A still stronger argument in favour of disinfection is its results in former years and in the mofussil. I have been Civil Surgeon of Hughli during the years 1901, 1902, and 1904. In each of these years plague was epidemic in Calcutta from February to May, and in each year we had numerous cases imported into Hughli, both into the town and into mofussil villages. With one or two exceptions, disinfection was carried out in all these cases, and in none of them did any other cases follow. This looks an excellent result. But in one or two cases disinfection was not done, because the case did not come to light till long after its occurrence. And in these cases equally no further attacks followed. Also, it must happen that imported cases die, or still more probably recover, without ever being heard of at all. Yet no epidemic follows. For any spread of the disease, even in a remote mofussil village, would soon come to light. Therefore the thought must force itself upon us, whether the results in the disinfecting cases would not have been equally good, if no disinfection at all had been done.

On the whole, it seems to me, that disinfection is an advisable and apparently a useful precaution, as long as only imported cases, or a few isolated cases arising from previous importations, are taking place. But when once a locality becomes thoroughly infected, it seems doubtful whether disinfection can be of any real use.

Administration.—When plague first broke out, the municipality appointed two Assistant Health Officers, Assistant Surgeon B. K. Chaudhri for the three southern wards, and a local practitioner, Dr. Johar Lal De, M.B., for the three northern wards. Ward committees were also appointed for the infected wards. After plague had become epidemic in the town, two local native doctors were engaged as whole time officers for special plague duty, Babu Baidya Nath Banerji and Chaudhri Fazlar Rashid. Both worked extremely well, and got on well with the people.

There was not much concealment of cases, and, where it occurred, it appeared to be due rather to apathy, than to absolute objection. Even if people did not report cases occurring in their own families, they were ready enough to report cases among their neighbours, and thus most came to light sooner or later. The large number not reported till after death, was due in great

part to the rapidity with which death, in many cases, followed the attack. Opposition there was practically none. Many people appeared to be grateful for the interest taken in them, and utter apathy was the nearest approach to opposition experienced.

A good many people left the town during the epidemic, but the number who did so was not sufficient to make any difference in the numbers visible in the streets. I should think it probable that many cases of plague must have been exported from Hughli and imported into other places, but only seven such cases came to light. In two instances men left plague infected houses here and went to villages in Bardwan District, in both cases the man's departure was found out, soon after he had gone, and reported to the Civil Surgeon of Bardwan; one man died of plague, the other either remained free or recovered. I only heard of two cases from Hughli town going to villages in the interior of Hughli District, both were discovered and reported by the local police before their departure from Hughli was known. Three cases were removed to Calcutta actually suffering from plague, and died there. Cases of plague were constantly coming from French Chandarnagar into British territory, and no doubt a similar export must have taken place in the opposite direction, though not a single case, actually suffering from plague, was known to have moved into the French settlement.

Plague in animals.—Nothing was heard of any unusual mortality among rats during the earlier part of the epidemic. While plague was at its height in Ward VI, the only information I received of rats dying was from the police outpost, in which two dead rats were found. No case of plague occurred in the outpost itself though there were many fatal cases both before and in the immediate vicinity. In April and the first half of May, numerous complaints were made of rats being found dead in various parts of Ward II, and in all such cases the house was disinfected. Plague, however, was prevalent in the ward some time before any mortality among rats was reported.

As regards other animals I heard in one instance that a goat, and in another case that a cow, had died on the same premises as a plague case, with symptoms of swelling of the throat. In neither case did I see the animal alive or hear of its illness till after its death. I heard of two squirrels and one Hanuman monkey being found dead in Kankasali in April, Hanumans abound here. A cat in a European house was suspected of plague. I saw the animal, which had some indistinct swelling of the throat, and appeared to be out of sorts, it recovered in a few days.

General remarks.—The large majority of the cases occurred in *palka* houses, out of the whole 254 cases, only 44 occurred in *kacha* mud and thatch huts, the 44 cases being distributed among 31 such huts with 13 recoveries and 31 deaths. In one instance five cases, of which three recovered, occurred in one hut. In three instances, the same hut had three cases of plague, with none, one and two recoveries respectively. I do not know what proportion of the population of the town occupy *palka* houses and *kacha* huts respectively, but those who live in *palka* houses must be in the majority. I may say that I only saw four cases of plague in large, cleanly kept, and fairly airy houses, of these one was imported, that case and one of the others recovered.

Registration of deaths is carried out at four police outposts, Shahganj, Pipalpat, Kharna Bazar, and British Chandarnagar. Deaths are supposed to be reported by the relatives of the deceased, the town chowkidars also report deaths for registration. Throughout the epidemic I constantly visited these four registering stations, checking the plague deaths registered with my own list of cases, the deaths as registered agree with the numbers on my own list. But this result was only obtained with a great deal of trouble. At least ten per cent of the total number of plague deaths would never have been registered at all, if I had not reported the

names myself, and seen that they were entered in the register. On the other hand, on two occasions I detected the same case being registered twice over under slightly different names. Failure to register deaths is, of course, an offence under the law, but it was not considered advisable to prosecute for this cause in any instance. In many cases, indeed, in which no relative registered the death, it would not have been possible to find any one against whom a prosecution would lie, either no adult male relative survived or all had left the town.

Duration—The information obtainable as to the date of attack is in many instances so indefinite that little can be said under this head. Several cases were reported as having died within twenty-four hours of the first appearance of symptoms. One case was actually under observation for eighteen days, from 10th to 28th March, when he died.

Complications were observed in several instances. The case just mentioned, which survived eighteen days, had an attack of chicken-pox, from 18th to 22nd March. The relatives called it small pox, and shut up the patient, a man of 30 years of age, for several days, during which they would neither allow him to be seen nor to take medicines, while they did puja to Sitala, the goddess of small pox. There were only about a score of vesicles, on the back and chest. Two of the cervical glands suppurated and were opened, and this was one of the two cases which died after the incision of suppurated glands. Four pregnant women were attacked, all four died. Three of these were bubonic cases, said to be pregnant six, eight, and eight months respectively, none of them were confined before death. The fourth was confined on the day of her attack, she was said to be at full time, and died of pneumonic plague on the third day. A boy of seven was said to have been suffering from fever with typhoid symptoms for fourteen days, when he was attacked with plague he recovered. An old woman suffering from a carbuncle on the back was attacked with pneumonic plague, and died, another woman in the same house contracted the disease from her, and also died. An epileptic boy died of bubonic plague. A girl suffering from bubonic plague also contracted measles she recovered. Many of the children attacked, both fatal and non fatal cases, were suffering badly from itch. A female child, after her recovery from bubonic plague, suffered from chorea which gradually improved.

There is no reason, of course, why a patient suffering from chronic disease such as tuberculosis or malarial cachexia should not be attacked by plague, when that disease is prevalent. Similarly, a patient suffering from plague may contract any other contagious disease from which another inmate of the house is suffering. These facts add materially to the difficulty of diagnosis. During the epidemic a large number of cases were reported as plague, which on enquiry turned out or at least were considered, not to be cases of plague. At any rate, no other case of plague occurred in connection with, or arising from any of these cases. In all, 102 such cases were reported, of which I saw 64 myself, the others were seen by various members of the plague staff, or if they were not seen alive, enquiry was made of the practitioners who had attended them. These cases may be tabulated as follows—

TABLE No. VII—Cases enquired into, other than Plague

Disease	Cases	Deaths
Malarial fever	68	3
Malarial cachexia, with enlarged spleen	3	2
Pneumonia	11	6
Mumps	5	
Itch	4	
Enteric fever	1	1
Venereal	4	
Intestinal obstruction	1	1
Erysipelas	2	
Cholera	1	1
Measles	2	
TOTAL	102	14

None of the plague staff were themselves attacked, but cases occurred in the families of two of the ward inspectors. Both were living in the midst of affected areas, both cases were children, one recovered, the other died. There were no cases in the jail, nor among the police. No cases occurred among the clerks in the public offices, but several among their families. No student of the Hughli College or Collegiate School contracted plague though there was a false alarm of a case in the Mohamedan hostel, it turned out to be simple fever. One case occurred in the Hughli Training College, the boy had only joined from his home four days before, and there was no plague at that time in the vicinity, so whether he had imported the disease with him, or caught it locally, could not be ascertained. He died on the following day, and a few days later a servant also died of plague, the college was closed. Another student of this college, a resident of the town, died later on at his home. The Chinsura Training Academy, a large school of 450 boys, had four fatal cases. This school has no boarding house, the boys died at their own homes in the infected area. One boy of the Mission School also died at his home.

Plague in the mofussil—Only nineteen cases occurred in the Sadar and Arambagh Sub-divisions, with four recoveries and fifteen deaths. Of these 19 cases 17 were imported, ten from Calcutta, two from Jamalpur in Monghyr, and one each from Chinsura, French Chandarnagar, Serampur, Bankipur, and Sahibganj. It is strange that there was not a much larger number of cases exported into the district from the infected towns of Hughli Chinsura and Chandarnagar. Of the other two cases one was a woman living at Dasghura, in Dhanial khali Thana. She had not been outside the village herself, but was a servant in a large house to which some Babus had recently come from Calcutta. Doubtless the infection was brought by these men, in clothes or other belongings, but no definite source of importation could be traced. The other was a man residing at Patan, in Polba Thana, he had been staying in Chinsura shortly before, so this case also may be considered as one infected in Hughli Chinsura town.

Plague in French Chandarnagar—I am indebted to Monsieur Tardivel, Mayor of Chandarnagar, for the final figures of the epidemic in his jurisdiction. The first case died on 11th January, the last on 3rd June. In all there were 223 cases, with 174 deaths and 49 recoveries, a case mortality of 78.02 per cent as compared to 80.31 in Hughli-Chinsura. The ratio per thousand of cases and deaths to the population of French Chandarnagar, 26,000, came to 8.57 and 6.69 respectively, as compared to 8.67 and 6.99 in Hughli Chinsura. The great majority of the cases occurred in the northern part of the settlement, in close proximity to Ward VI of Hughli-Chinsura. Two European or Eurasian females died, I heard, but one of these was an imported case from Calcutta. The disease was imported from Calcutta in the first instance. I was informed that both rats and squirrels died in large numbers.

THE VARIETIES OF BUBO MET WITH IN BUBONIC PLAGUE AND THE RATIONAL TREATMENT OF EACH KIND

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In any large collection of cases of bubonic plague the type of bubo met with will be found to resolve into four distinct varieties, each with peculiar features in itself, and modifying the clinical course of the disease, and calling for some differences in the local treatment. The varieties of bubo are the common softening

bubo, the *indurated bubo*, the *oedematous bubo*, and the somewhat rare form—the *hard late bubo*.

1 *The softening bubo*—The common site for this is the femoral region. Commencing on the first, second, or third day of the fever as a very tender lump the size of a pea, within twenty-four hours after its appearance it has reached the size of a walnut, and on the following day the size of an egg. There is little or no oedema in the cellular tissue over and around the gland. From the commencement it is the seat of pain, out of all proportion to the size of the mass. For three or four days it is extremely tender, and the patient resents all manipulations, and if he is semi-conscious the examination of the lump will rouse him from his lethargy. If the patient lives to the fifth day, the bubo will be found to be considerably enlarged and much softer on palpation, and with the softening there is in the same proportion a diminution of the local discomfort. The softening may be obvious in one portion of the bubo only, or this may be general throughout the mass. As a rule there is not absolute fluctuation, but the impression given to the examining finger is similar to that of a tightly stuffed but delicate pin-cushion. In some cases, however, the disintegrating gland breaks down somewhat rapidly into fluid. This fluid may be pus pure and simple, but more often is thin, sanious pus containing shreddy particles of necrosed tissue.

The "pin-cushion bubo" will be ready for incision from the eighth to the fourteenth day of the disease, and there will be evacuated a quantity of soft easily friable slough, containing here and there pea-like masses of caseous or purulent material.

Of course, the patient often dies before the bubo has had time to undergo general softening. Nevertheless, the essential characters remain, namely, that it does not tend to involve the overlying integument, it softens as it enlarges, and is associated with only a small amount of surrounding oedema, if any at all. Excluding the fourth variety of bubo, this represents the most favourable type as regards prognosis.

In rare instances, and that only in mild cases, the bubo, after softening and enlarging, goes no further. With the disappearance of the general symptoms of the disease the soft or elastic gland begins slowly to shrink and harden. The enlargement may almost entirely disappear, but more often persists as a fairly movable hard mass. If the patient completely recovers his health, its presence will give rise to no trouble. But if the post-febrile debilitated condition is marked and prolonged, weeks after the patient has been discharged as cured, the gland may suddenly again become painful, soften, and form an abscess.

Treatment of the softening bubo—In this paper I am not concerned with the question of the general treatment of plague, but only with the treatment of the bubo itself. During the

stress of a severe plague epidemic, it is absolutely essential to reduce the stay of the convalescents in hospital to the minimum period possible. Not only is every hospital bed of value, but the early return of cases to their homes induces confidence in the hospital management among those of the population who see these persons return in health. It is remarkable how rapidly the convalescent wards can be emptied of patients when the stage of sloughing and suppuration is shortened by rational and intelligent treatment.

The treatment of this form of bubo should be by continuous hot fomentations, applied from the first appearance of the bubo up to the stage of general softening. The application of moist heat to the painful part gives the greatest possible relief to the patient, as I can testify from my own personal experience of the disease. But the utility of this simple method is often nullified by the ignorance or carelessness of those to whom (in hospital work) the care of the patient must be left from hour to hour. Abernethy is credited with the statement that many of the surgeons of his time were so ignorant that they did not even know how to make a poultice. It is a fact that few of our hospital assistants and fewer of the ward-boy class whom we see in our plague hospitals, have ever been properly instructed in the proper methods of making a fomentation. This fact might be remembered by medical men in charge of plague hospitals, and as a preliminary when fomentations are ordered as a routine measure, the hospital servants should be impressed with the necessity of using very hot water for the fomentation and be initiated in the use of the "winger," so that the application may not be used too hot or too wet. They should also be instructed in the proper sizes of fomentations, otherwise they will be applying pieces of lint two inches square, a condition of things which would be perfectly useless. Twelve inches by twelve is a reasonable size for the fomentation for an ordinary femoral bubo. If anyone will consider the helplessness and ignorance of the unfortunate people who come during plague seasons into our hospitals, it will be recognised that this advice on an apparently simple matter is not superfluous, but that attention to it will save a vast amount of unnecessary pain.

Clean lint, covered with cotton-wool will do for the fomentations, thick boric lint is better, spongiopiline is best. The fomentation should be kept in place by that form of bandage which can be loosened without moving the patient in the bed. All movement of plague patients should be avoided as long as there is any danger of sudden failure of the vasomotor system. The best bandage for buboes about the groin and axilla is a large triangular bandage, and for buboes of the neck a many-tailed bandage.

When the pin-cushion stage is reached or there is actual fluctuation to be felt, the bubo is

ready for incision, and the sooner it is opened the better. If a suppurating bubo is left too long, the pus is apt to burrow among the muscles and fascial planes; if a softening bubo is left, the skin will eventually give way, and the whole mass will slough out through a hideous, gaping cavity, which, on account of the low powers of recuperation the patient possesses, will take a long time to granulate over.

Before the stage of actual softening is reached, care should be taken that the limb is placed so that the inflamed parts are as much as possible relaxed, the limb being supported by cushions for the purpose.

The bubo should be opened under chloride of ethyl. No plague hospital is complete without at least two cylinders of this valuable local anæsthetic. The incision and the rest of the operation are rendered completely painless, it saves a great amount of time which would be taken up by the administration of chloroform, a very important matter in the management of a crowded plague hospital, and finally many of the more ignorant natives have no objection to a painless operation they can actually see carried out on their bodies, whereas they are suspicious of the use of that mysterious "medicine" which deprives them for a time of their senses. Chloroform should only be used for operations on children and for most buboes about the neck.

The incision should be long enough to admit the little finger up to its base, and in large buboes long enough for the forefinger to be introduced. When the bubo is beneath the deep fascia, this should be included in part of the primary incision. Dressing forceps are then introduced closed, and the opening in the fascia enlarged on its withdrawal. The forceps or a blunt director are then introduced, and the whole slough thoroughly broken up, the director exploring the cavity in all directions. This is an absolutely essential part of the operation, and is painless except for a momentary twinge when the instrument comes in contact with one of the cutaneous nerves. When the slough is broken up, the finger is introduced and the debris removed through the wound. When the operator has made certain by this means, that the whole slough is out, a small swab of lint or cyanide gauze should be introduced on the dressing forceps, and the wall of the cavity swabbed dry. If the cavity is large, a small drain of gauze should be left in to prevent the margins of the wound from closing, and the whole is then covered with a pad of clean lint wrung out of 1 in 60 carbolic.

In the great majority of cases the wound will be found to have become healed up within seven days from the operation.

In no case is it of use, and in many cases it is harmful, to cut into the inflamed bubo before the stage of softening is reached. The application of tincture of iodine to a plague bubo is wrong in theory and pernicious in practice. A

favourite method with some is to smear the part with glycerine and belladonna, this does not relieve the pain as much as hot fomentations, and in practice interferes with daily examination of the part, and is extremely dirty. All the greasy material has to be scrubbed off with turpentine when the time comes for operation, and this is painful and wastes time.

2. *The indurated bubo.*—The principal site for this variety is among the glands lying immediately in contact with Poupart's ligament. It is also generally found in those rare cases where the occipital and mastoid glands are affected. Buboes under the parotid fascia are also of this class. In fact, the chief local symptoms would appear to be induced by the existence of an acutely inflamed gland beneath a tense and non-distensile fascia.

In these cases the bubo is extremely hard and intensely painful, and almost at once becomes adherent to the skin. The skin is acutely congested, or with a livid centre surrounded by a scarlet areola, which gradually shades off into the surrounding tissues. The tense and scarlet integument soon becomes indurated, and all outline of the bubo is lost. The inflammation of the part is so acute that the exudation from the congested vessels acting under pressure of the overlying fascia produces necrosis of all the affected tissues, and points of black, gangrenous material appear towards the centre of the livid mass. The areas of necrosis enlarge and fuse, and ultimately the whole patch sloughs out, exposing the muscular planes beneath which are covered with a thin grey slough. The cavity is generally shallow, but covers a large area, about the size of the palmar surface of the hand and fingers. The edges are steep or punched out, and indurated, the margins are generally livid with a well-marked scarlet areola. In a few days under the action of mild antiseptic dressings the surface cleans, and the cavity gradually takes on the characters of an ordinary callous ulcer.

The healing up of this ulcer is attended with the formation of a considerable amount of cicatricial tissue, which produces a large irregular scar. It is often the seat of neuralgic pains for some time after convalescence, and by its pressure on the superficial veins of the limb, or by the obliteration of the lymphatic channels, frequently causes a chronic oedema of the parts at a lower level. In a few cases owing to the disinclination of the patient to stretch the adhesions, the thigh is retained in a position of slight flexion, and adaptive shortening of the ligaments and muscles about the front of the hip-joint occurs.

Treatment of the indurated bubo.—The prognosis in this type is worse than in that of the softening bubo, however, many of the cases do recover. The early stages are accompanied by very great pain in the bubo, which often necessitates a hypodermic injection of morphia.

Continuous fomentations should be used as in the first variety. When the stage of matting and redness is reached, the application of a dozen leeches is indicated, and relieves the pain considerably. In addition to this it has one of two effects,—either the inflamed tissues remain hard and the necrosed mass sloughs out as above described, or the lessened tension caused by the abstraction of blood allows the inflammation to go on to suppuration, in the latter case the incision should be carried out as in the softening bubo.

If the hardness persists after the abstraction of blood, fomentations should be continued until signs of gangrene supervene. A long incision should then be made under chloride of ethyl. The operator will often be surprised on cutting into a large boggy mass, to find when the director is passed into the slough in all directions, that no pus is reached. The tissues are soft and generally dry. Fomentations of hot lint steeped in 1 in 80 carbolic should be applied until the whole mass has sloughed out. The dressings should then be changed to compresses of lint wrung out of 1 in 1,000 perchloride of mercury, and continued until there is a clean granulating surface. In order to accelerate convalescence, lint moistened with the useful old-fashioned "red lotion" should be applied, sulphate of zinc, two grains to the ounce of water with one drachm of compound tincture of lavender. In some of these cases and under conditions where asepsis can be calculated on, skin grafting will be found of value.

3 *The œdematous bubo.*—The common site for this variety is the axilla or the neck. The prognosis of the most marked cases is almost hopeless. The amount of the œdema into the cellular tissues varies in different cases, in some the enlarged gland can be palpated through the infiltrated tissues, in others the axilla is filled up with a fluctuating mass, and which within twenty-four hours has obscured most of the ribs on the same side of the body. When the neck is the seat of the bubo the whole of one side is bulged out from the mastoid process to the clavicle, and the distension may be marked along the front of the trachea, and slightly less so on the opposite side of the neck. These buboes are always intensely painful, but in the most acute cases it is fortunate that the patient's powers of perception and sensation rapidly become dulled from the influence of the toxins on the central nervous system. When the œdematous condition is very marked and rapid in its advance, the distended mass generally becomes livid in the centre and appears as if about to slough, but this latter seldom occurs as the patient dies before there has been time for it to happen.

When the bubo is in the cervical region respiration is soon impeded owing to the pressure of the inflammatory products on the trachea, or the inflammation extends to the larynx and the patient dies suddenly from œdema of the glottis. In many cases there is a rapidly spreading

pulmonary œdema, or a secondary pneumonia which ends the case.

Treatment of the œdematous bubo.—Owing to the intense pain caused by these buboes, hypodermic injections of morphia must be given. Fomentations should be continuous in the early stages, and if the case is going to progress favourably, the gland will enlarge and soften, and the œdema will then gradually become a less marked feature of the local condition. The mass will be incised and the sloughs evacuated in the usual way. Unfortunately, in the great majority of these cases, this favourable result does not happen. The local distension becomes enormous and the pain intolerable. From an experience of a large number of these cases I feel sure that it is best practice to make a long semi-lunar incision into the most dependent part of the fluctuating mass, and allow the thin sanguinous fluid to soak into the dressings. Pints of this fluid will come away, and this does relieve the distressed breathing in cervical buboes, and to a less extent the local pain.

4 *The hard late bubo.*—This is only seldom seen. There are uncommon cases of plague of the type of a chronic or sub-acute septicæmia, which simulate typhoid fever. In the absence of bacteriological tests these can only be diagnosed as plague, in the early stages, from the case occurring in a family which has shown one or more victims of the bubonic variety. On twelfth or fourteenth day of the fever a gland in the femoral or sub-maxillary, or more often the sub-mental region, will be found to have undergone a sudden painless enlargement. The gland is generally of a stony hardness, remains painless, and seldom enlarges beyond the size of a filbert.

There are also cases of multiple buboes, most often seen in children, where the first buboes go on to sloughing and suppuration, and where just before the stage of convalescence is reached, hard painless enlargements appear in the glands of various parts of the body. They never break down and remain free of the skin. The prognosis in these cases is good.

Treatment of the hard late bubo.—As these glands are painless, they do not require any local treatment. If during the convalescent stage they remain enlarged and are the seat of neuralgic pains, they can be easily enucleated.

THE TREATMENT OF CATARACT IN CHILDREN

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It is long since I gave up the orthodox treatment of cataract in children—soft cataract—by needling on account of its extremely unsatisfactory results. I have seen cases needled six times by leading men in Europe with no improvement in vision, the opaque matter remaining

stationary and not being in any way absorbed. Cataracts in children have, in my experience, so very often an opaque capsule that, assuming the lens matter be absorbed, the opaque capsule or after-cataract will have to be dealt with later on.* Many cataracts in children, if of a few years' standing, have little more than an opaque and often calcareous capsule, the soft matter having disappeared by the order of nature. The majority of cataracts in children we may divide into two classes: (a) Those whose juice is of milky consistency. These are the only cases which respond to needling. (b) Those whose juice is of a gelatinous consistency. You may needle these as often as you like, but the matter remains stationary and is not absorbed. This class, in my experience, is not a mere curiosity but includes a considerable proportion of cataracts in children, and it is in these cases that the needler is so often disappointed. Any one with an experienced eye can tell at a glance to which variety the cataract belongs before he operates. The (a) variety has a uniform milky appearance. The (b) variety has a somewhat flocculent appearance, somewhat like the appearance of pearl. I may here say that by no mere language is it possible to describe intelligibly such details. They require to be seen, and once pointed out they will be ever afterwards recognised, and cataract in children being such a small proportion of cataract in general that those desirous of seeing them must go to large ophthalmic hospitals where cataracts are being operated on in quantity. In ophthalmic hospitals outside India a man desirous of seeing such things may be years before he sees a dozen cases.

My routine practice now is to extract cataracts of all varieties in children. The incision required is not more than $\frac{1}{8}$ th of an inch, when the capsule is lacerated the soft material escapes easily from this wound. The capsule, if opaque, I always tear out at the same time by reaching in an iris forceps and getting an extensive grip of it and fetching out. Even if not opaque I have no hesitation in tearing a piece out of it so as to avoid the needling of an after-cataract later on. There may be an escape of a bead of vitreous, but it is of no importance when compared with an after-cataract, the alternative. This operation can be done with or without an iridectomy according to the fancy of the operator. Personally, I do it with a small iridectomy and afterwards instil in a few drops of eserine solution on account of the great tendency in these cases to prolapse of iris. The result is always satisfactory when compared with needling. There is no lens matter left behind, and very seldom iritis. The after-cataract has been dealt with and the patient leaves hospital in about three or four days, so small is the necessary wound. The child of course requires to be chloroformed

* I shall deal with after cataract in a later paper.

A question often asked is, at what age should a cataract in a child be extracted—congenital or otherwise? I have seen a fair number of congenital cataracts, and in my experience they are always in micro-ophthalmic eyes, as is also coloboma of the iris. My opinion is that cataract in children should be extracted as soon as diagnosed. They do as well at a few months' old as at any other age. It is of the utmost importance in children to remove any obstacle to light getting at the retina as early as possible. Every body knows that the visual function does not develop if not used, and if not allowed to develop in the first few years of life, it will never develop to any thing like perfection—a congenital or early cataract removed at six years of age gives poor vision, at nine years of age much poorer still, and at twelve years of age the vision resulting is not of much use to the possessor. This is assuming that the cataract has been there from the first year of life. These facts are all familiar to us in the normal development of vision in the case of squint. The conditions are somewhat reversed in adult life. If an adult has had a cataract in one eye for ten years and a cataract in the other eye for one—a case not unfrequently met with—both being equally good beforehand, and we extract both cataracts at the same sitting, the results looking perfect, yet the eye with the ten-year old cataract has not near as good vision as the eye with the one-year old cataract. This retrograde process in an adult eye long excluded from light differs from the child's eye long excluded from light in the fact that vision in the adult slowly and steadily improves to be nearly as good as if his cataract had been removed when a year old. It is occasionally necessary to warn a patient who has a cataract of long standing that vision will not be at its best when he leaves hospital, but that it will steadily improve. In the case of the child the function has been prevented from developing. In the case of the adult the process is retrograde when excluded from light, but is capable of recovering when light is re-admitted.

THE SIGNIFICANCE OF THE PYRIFORM AND GLOBULAR BODIES PRESENT IN THE CIRCULATION AND ORGANS IN VARIOUS FORMS OF DISEASE IN MAN AND ANIMALS WITH SUGGESTIONS REGARDING THEIR IDENTIFICATION AND CLASSIFICATION

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(Continued from p. 338)

Some points in the differential diagnosis of the various pyriform bodies.—The pyriform, circular, oval and irregular shaped bodies are present in varying numbers, and are capable of demonstration in the circulation organs or tissues of all human and animal diseases in which the "causal agent" is a trypanosoma. Further, these bodies are always present in varying numbers in the intestinal tract of Diptera in which various species of *Herpetomonas* are found, and lastly, similar

forms are present in the circulation and organs of splenic cases (Kala-azar) and in the tissues of Delhi sore, but not in the general circulation of patients suffering from the last named localized affection.

With regard to the differential diagnosis of these immature forms in the various diseases of man and animals. The bodies derived from trypanosomata always present two circular nuclei, the large one the nutritive, while the smaller in the great majority of instances remains circular and single. This form of cell is not prone to division in the circulation.

In various species of Herpetomounds, the immature bodies assume all the above mentioned forms and possess two nuclei, but the smaller, the blepharoplast, seldom exhibits a circular form for any time, it is usually represented by a straight rod-shaped body which is frequently double. This form of cell also is not very prone to division in the proventricle of Diptera.

The splenic bodies as described usually assume the rod form of blepharoplast, but may appear as a dot only. These cells are very prone to undergo division in the general circulation, and in the spleen of Kala-azar cases, and might be classed as precocious in this respect. The last form, the pyriform bodies, found localized in the tissues of Delhi sore, but not generalized through the circulation, are also described as possessing two nuclei, the blepharoplast varying from a dot to a long thick rod. These forms, as in the case of the splenic bodies, undergo division in the affected tissues.

Although the bodies found in the human subject exhibit features common to both forms, those figured by James,¹⁸ certainly present characteristics which have not been demonstrated up to the present to the same extent in those observed and figured by Christophers. I refer to the markedly pointed, spindle-shaped bodies referred to as "minute torpedo forms." These peculiarities may perhaps be due to the conditions under which the bodies are developed in the tissues, being influenced by pressure. It, however, raises the question put forward by James¹⁸ "that these two forms of organisms, though obviously belonging to the same class, are different species."

The question as to what particular families these immature forms of parasites, (pear shaped, oval and circular bodies) found in splenic cases, Delhi sore and in the undetermined species of Diptera, represent, remains in certain instances to be decided. There is, however, but little doubt that the immature forms generally are the individual units of spheroid colonies, whether derived from globular, ellipsoidal or cylindrical aggregates, in which individual cells form a superficial layer in a common gelatinous matrix in the first instance.¹⁴ These bodies are a stage in the development of certain protozoa (flagellate), and the pear shaped and circular bodies in splenic cases and Delhi sore are (if they follow the same propagation processes) probably either as a whole or in part are the outcome of *Parthenogenesis* or are reproductions of the indifferent individuals, for, according to Prowazek¹⁵ in *Etiogenesis of H.M.D.*, the globular bodies degenerate sooner or later, for a nutritive nucleus perishes.

I have little doubt in my own mind that if carefully examined for, these circular or pyriform bodies will be found in the blood of the general circulation, cerebrospinal fluid, organs, specially spleen and liver, and in the lymphatic glands in cases of Sleeping sickness, at one or other stage of the disease.

Further, that these bodies will be found, when carefully searched for, in any other form or forms of trypanosomiasis in the human subject now recognized or to be diagnosed in the future.

Therefore, to sum up, it may be stated that the pear shaped, oval and circular bodies, termed immature forms, are the early stage of development of certain species of protozoa. The particular forms, as above mentioned, appear to be constantly present in the early stages of development in the families of Trypanosomidae including Trypanoplasmatia, in Herpetomoundae and some

other species which include several as yet undescribed and perhaps new varieties.

Points in common between the symptoms observed in trypanosomiasis in animals and Kala Azar in man—Kala azar as described by various authors¹⁶ presents points in common with trypanosomiasis in animals in this country. For instance, the disease is common at the foot of the hills, and along one bank of a river, if it is low and marshy. It sets in during the hot rainy season and is characterized by intermittent and remittent fevers, extensive anaemia, universal emaciation, great weakness, and considerable enlargement of liver and spleen is sometimes present. Oedema of the feet and dependent parts is also sometimes observed. Mortality, 96 per cent of the cases attacked.

If we compare the stages during which the pyriform and circular bodies are found in trypanosomiasis in animals and in splenic enlargement in human beings, we can discern some similarity between the two forms of disease. In animals pyriform bodies may be first observed at the seat of inoculation during the period of incubation of the disease (Surra, Nagana, Dourine). Further, during the paroxysms of Surra in equines, camels and bovines they are observed in appreciable numbers and are present concurrently with trypanosomata in large numbers, but in the intermissions they are only present. The intermissions at first very short gradually become longer in duration as the disease progresses, and in animals which ultimately recover from an attack of trypanosomiasis, such as bovines, equines inoculated with camel Surra and occasionally camels, the immature forms of the parasites for long periods are present in small numbers, and are at such times the only trypanosomic forms which can be discovered in the peripheral circulation of the affected animals.

As long as the pear shaped bodies are present, they retain the power of reproducing the disease in healthy animals inoculated with such blood. But at a later date even these immature forms disappear from the circulation, and if a large quantity (50cc.) of blood be then injected into a susceptible animal, it fails to reproduce the disease. This final destruction of the immature forms must be attributed to the powerful and continued action through long periods of the bodies elaborated in the blood of the host. In the human subject, but few definite observations have been conducted up to the present, with regard to the exact stage of splenic disease, when the pyriform bodies primarily made their appearance in the blood, and whether later in the course of the disease (especially in the small percentage of cases which recover) the bodies disappear *in toto*. Sufficient reason for this want of knowledge is referable to the fact that, the parasitical immature forms having been so recently observed for the first time in advanced stages of the disease a sufficient time has not yet elapsed to allow of observers following out the various phases of what is frequently a chronic form of malady. Consequently, in the absence of the required information with regard to practical points connected with this disease, it is necessary to turn our attention to the recorded symptoms of the same. Certain ones mentioned by Rogers¹⁶ as occurring in Kala azar immediately attract attention, and at once emphasize the great similarity between the spontaneous trypanosomiasis in the camel, equines inoculated with the camel haematozoon and Kala azar in man. I refer particularly to the following passage—"The fever exhibits *occasional intermissions, which may last a few days or weeks*, during the latter stages of the disease the fever is not so high as at the commencement, and in those who survive the hot rainy season, usually disappears during the 'cold dry season, to revive only too often in the next rainy season'."

The first few words in italics vividly bring to mind the possibility that these periods at first short and later more prolonged, may be the true manifestations of paroxysms and intermissions as observed in all forms of trypanosomiasis in the lower animals, and parti-

cularly those in the camel. The cause of the intermission (the accumulation of bio-chemical products or other changes in the blood at the termination of a paroxysm, causing destruction of the mature trypanosomata), is Nature's attempt at a cure.

In comparing the points of resemblance of these diseases as met with in animals which pass through an attack and recover, and that in man, we find that

In animals—

- (a) The pyriform bodies are more or less present during the whole course of the malady, and finally disappear during a long period of intermission, but they undergo division but seldom *in vivo*.
- (b) The serum is endowed with bactericidal power, especially just at the termination of a paroxysm and at the commencement of an intermission.
- (c) It is probably the specific action of this serum that gradually destroys the pyriform bodies as they attain to maturity, and thus oft repeated action, in certain species of animals, prolongs the course of disease in some, while in others it brings about a cure.

In man—

The pyriform bodies are found in well marked cases of the disease in the peripheral circulation and in large numbers in the blood obtained by splenic puncture, and these bodies appear to be endowed with the power of division *in vivo*, but not of attaining their fully developed form, as far as is yet known.

Remarks—The following questions therefore suggest themselves—

- (a) Whether the mature form of flagellate is capable of development in the human subject at an earlier stage of the disease, than that at which the splenic bodies are capable of being demonstrated?
- (b) Whether healthy human blood *per se* possesses the power of inhibiting the development of the pyriform bodies into the mature forms, so that *in vivo* they can only increase by division but never attain maturity?
- (c) Whether as in bovines and camels a period arrives when the elaboration of certain products in the blood of the host, inhibit the further development to the mature form of parasite, and so only allow of the presence of the pyriform bodies?

As the pyriform bodies obtained by splenic puncture from cases of Kala azar can be developed into their mature forms *in vitro* according to the method of Rogers, I would suggest that these latter be submitted to the action of the blood serum, obtained from advanced and typical cases of the disease, and tests be conducted as to the bactericidal and agglutinating action of such serum, which has been kept in the dark. If experiments with this end in view can be carried out upon flagellates, developed in 10% sodium citrate solution, and demonstrated, by comparison with those in animals, such results would go far towards proving that the mature organisms had been present at an earlier date in the human circulation of such patients, and that the mature parasites had produced certain changes in the blood, which inhibited *in vivo*, the further development of the splenic bodies into mature flagellate organisms. On the other hand, if a "bactericidal" action is found present in human serum drawn from splenic cases, after proof has been furnished of the absence of flagellate forms during any stage of the disease, then it would appear feasible to surmise that the pyriform bodies themselves have the power to produce such bio chemical changes in the blood of the general circulation.

Following the method of Rogers,¹⁸ similar tests should be conducted with regard to the bodies present in

patients, the subjects of Delhi sore, and the action of the serum derived from such cases, determined upon the flagellates which are almost certain to be developed from the pyriform bodies in artificial cultures. Further, these mature flagellates when artificially developed should be subjected to the serum obtained from splenic cases and *vice versa*. The above mentioned experiments require to be carefully carried out in order to furnish absolute proof in the various links in the chain, should negative results be obtained.

The weight of evidence, however, is against healthy human blood possessing any such power, and it is also against the blood of splenic cases in an advanced stage, exhibiting any great amount of inhibitory influence against the pyriform bodies in view of the fact that the mature organisms have only been developed *in vitro* at a low temperature 22° C, whereas intermittent and remittent forms of fever are almost constantly met with in all cases of splenic disease (Kala-azar) in the human subject. Therefore we must conclude that the normal temperature of the human body, 37° C, is most probably the inhibiting cause, *per se* or one of the principal causes, which will not allow of the immature form of the parasite developing into the mature flagellate organism. As we have ample proof in the various forms of trypanosomiasis in man and animals that the flagellates the "causal agents" of the respective diseases flourish, develop and mature respectively in the blood at temperatures ranging from normal limits to 41.6° C, and in the majority of instances without the virulence of the organisms or the course of the disease being unduly modified. This fact alone would almost prove to a certainty that the "causal agent" in its mature form in cases of splenic disease or Kala azar is not a typical form of trypanosoma, and further by analogy that the mature organism of Delhi sore when developed, will be proved also not to be a typical form of trypanosoma, but an organism varying but little from that already demonstrated by Rogers in the mature form in artificial cultures from splenic cases, which appear to occupy a position between the Herpetomonas and Trypanosoma from the point of view of structure.

The probability is that some of the following deductions bearing on the two forms of the disease, splenic cases and Delhi sore, may be useful to interested persons, who in the near future may be able to demonstrate the proof or fallacy of such surmises, should any one with the time and leisure find the necessary opportunities to undertake the investigations—

Splenic Cases

Delhi Sore

(i) The flagellate organism attains maturity only, either in a fly, mosquito or in both genera, in the presence of a fairly low temperature.

Same as in splenic cases

(ii) The mature flagellates are probably only present in such hosts during certain portions of the year, excluding the very hot and dry season.

Ditto

(iii) The mature parasite or the pyriform bodies may be introduced into the human system by a biting fly (Diptera or Culicidae). If in the mature form, it probably succumbs within a short period of its introduction but may leave the pyriform bodies as a legacy.

In the human system, either the mature or the resting form of the flagellate may be introduced—

(a) When a "solution of continuity" exists in the cutaneous tissues, by the deposition of excreta, which probably contains the resting form of the parasite, or

(b) Introduced into the tissues of man by a biting fly or mosquito. In such a case, the form of the parasite would depend

Splemic Cases

(iii)—Contd

(iv) Development of the pyriform bodies takes place by division only in the human circulation and organs. The normal temperature of the human body 37°C , probably proving, antagonistic to the further development of the mature form of the parasite.

(v) When the temperature is reduced to 22°C or a lower or cooler one be substituted, the pyriform bodies develop *in vitro* and attain to the mature form (Rogers')¹⁷. If the temperature of the human body be reduced as in the cases of chickens inoculated with *T. Evansi*, mature forms would probably develop and attain to a more advanced stage in man.

(vi) If feeding experiments be initiated with the species of Diptera and mosquitoes found to be common in the localities in which splenic cases are most numerous, and such insects be given the opportunity of imbibing blood containing the pyriform bodies, the various stages of the flagellate as developed by Rogers *in vitro* should be discovered in the intestinal tracts of such insects.

(vii) There is a possibility that some or all of the above mentioned changes might also be observed in the body of a frog if injected with the blood containing the pyriform bodies, and the animal kept at a temperature corresponding with that at which the pyriform bodies have been found to develop into the mature form.

When all the investigations have been carried out and concluded, the chief question still remains to be solved, namely, how to assist Nature in destroying the pyriform bodies, the immature form of the flagellate present in the blood and organs of splenic cases and in

Delhi Sore

upon whether the "causal agent" be introduced by the deposition of fresh blood from a previous case of disease in man, or whether a cycle of development of the flagellate takes place in the fly and an earlier stage in its life history be conveyed, as occurs when the sporozoites of *Plasmodium Præcox* are introduced by anophiles.

Development of the pyriform bodies by division is occasionally observed in the tissues of Delhi sore. The normal temperature of the human body (37°C) probably also proves antagonistic to the further development of the mature form of the parasite.

(Same as in splenic cases)

If feeding experiments be initiated with the species of Diptera and mosquitoes (common to the localities in which Delhi sore is endemic) with blood or material obtained from such sores, previously examined and found to contain the pyriform bodies, at any time, excluding the hot dry season, the result of such experiments should be that the various stages of the flagellate including the mature form of the parasite, should be discovered in some of the intestinal contents of the various species of flies and mosquitoes experimented with.

(Same as in splenic cases)

the tissues of Delhi sore. Following the researches of Ehrlich and Shiga,¹⁸ and Laveran¹⁹ at a more recent date, and taking into consideration the good results obtained in Surra cases in my own experiments, during the early nineties (when arsenic and mercury were administered, and in later ones also when arsenic and trypanrot were injected intravenously in equines) in which it was found so difficult to destroy the pyriform or immature forms, although the mature flagellates were more easily dealt with, I would suggest that the combination introduced by Laveran, viz, arsenic and trypanrot in combination, be tried in the two forms of disease, splenic and Delhi sore, in the former in the first instance to be administered either *per os* or *per rectum* or later, if it be found advisable, subcutaneously or intravenously.

It must be remembered, however, that animals suffering from trypanosomiasis will not tolerate the doses which can be given with impunity to healthy animals of the same species. In the localized or cutaneous sore, perhaps the exhibition of the combined drugs locally might prove sufficient, or the subcutaneous injection of small quantities of the drugs in solution into the affected tissues might prove more effectual, but as the pyriform bodies are not generalized throughout the system in the cases of Delhi sore, the intravenous injection of the substances may be contra-indicated.

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* I am greatly indebted to Professor Ehrlich for having so kindly supplied me with trypanrot, in order to make an exhaustive study of its effects when used alone and in combination with arsenic in different forms of *Trypanosomiasis*

A Mirror of Hospital Practice.

LITHOLAPAXY AN UNUSUAL OBSTACLE

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AN authority of such great repute as Freyer states that—"Every lithotomist of any experience must have come across cases in which an irregular, elongated calculus lies with its main portion, or body, in the bladder, and a small elongated head in the prostatic urethra, the two portions being united by a neck, corresponding with the vesical orifice of the urethra."* It is just such a calculus that it fell to my lot to deal with quite recently. The condition is one that is at first a little puzzling both as regards diagnosis and treatment. It may be that those who have had much experience of vesical calculus in other parts of India have met with this condition not infrequently, but to others to whom it is new, the following notes may be of some interest.

A young Manipuri boy, aged 15, was brought to the State Hospital, Manipur, with that appearance of severe and protracted suffering which one so often meets with in stone cases. The history of his trouble dated back about five years. The symptoms complained of did not differ materially from those of an ordinary stone case, except as regards their intensity. The act of micturition was accompanied by great agony, and the urine then only dribbled out in small quantities after much straining. As in so many of these cases, the penis was elongated by constant tugging at, during the act of micturition. The boy was extremely emaciated, and very fair skinned though being confined to his house for so long.

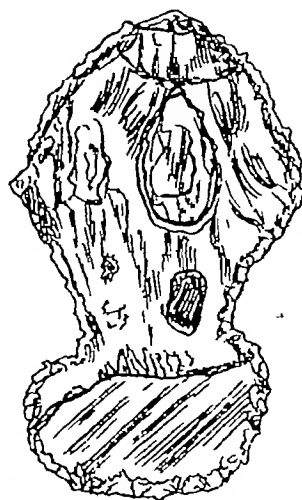
On examination the bladder was found to be dilated to above the umbilicus, and it was found that it never completely emptied itself. A No 5 sound was passed, and it was found to be arrested by striking against a stone in the prostatic urethra. No manipulation would displace the stone, nor enable the sound to pass alongside it. At first sight the case appeared to be one of impacted urethral calculus, but a finger in the rectum at once showed that the stone was an elongated one, with a smaller end in the prostatic urethra and a larger one in the bladder. I have found rectal examination of great value in most cases of vesical calculus. It enables one to get a fair idea of the size and shape of the stone and of its position if encysted. "When in doubt, examine the rectum" is advice that particularly applies to such cases, though it was given with reference to all surgical cases by the

surgeon I had the good fortune to work under when house surgeon.

Owing to the boy's debilitated condition, it was decided to postpone the operation for a few days. His health, however, was little improved, as his constant suffering could not be relieved, and his digestive functions were thoroughly upset. The foul condition of the urine was improved by the administration of urotropine and boracic acid, and it was decided to operate on May 8th, 1905.

Everything was prepared for the operation of litholapaxy, as it was thought most probable that the calculus would be displaced and pushed back into the bladder, when owing to its convenient size and shape it could have been crushed with great facility. The wretchedness of the boy's condition rendered this ideal operation all the more desirable. A sound was passed as far as the stone, but it was found impossible to move the latter, nor could the sound be pushed past it at any part of its circumference, by using a justifiable amount of pressure. The device of injecting fluid with spine force, while the tip of the cannula rested in the prostatic urethra, failed to move the stone and manipulation between a finger in the rectum and the sound in the urethra was equally futile. Various sizes of lithotrite were tried, but none could be made to grasp the stone. Here, then, was a case where partial impaction of a calculus in the urethra proved an absolute bar to the performance of the ideal operation of litholapaxy, and no alternative was left but to perform a cutting operation. It would have been interesting in such a case to have had one of Civiale's old instruments with a central piercing axis. It is possible that the stone would have been easily cracked by it, and its hold on the prostatic urethra thus overcome.

Lateral lithotomy was performed very easily, as the stone was easily cut down upon being held so far forward. When removed, the shape and character of the stone illustrated admirably the condition of affairs, as will be seen from the accompanying sketch. It



measures $2\frac{1}{2}'' \times 1\frac{1}{2}''$, weight only 7 grains 29 gr., and is of a marked dumb-bell shape. The smaller extremity rested in the prostatic urethra, and the constricted part was firmly held by the vesical orifice of the urethra. The surface has the characteristic appearance of a mulberry calculus, and the small excrescences were covered with fresh and old blood clot, especially over the impacted part.

This explains its firm hold. Lateral lithotomy, in spite of the comparative disuse into which it

* Modern Treatment of Stone Freyer, p 77, 2nd Ed

has fallen in England, undoubtedly has many advantages. In India, the fact that natives seem to object to it less than the abdominal operation, its easier performance without skilled assistance, and the straightforward after-treatment are all advantages in its favour.

Stone cases are very common in Manipur, and in spite of the fact that the Manipuri is very reluctant to enter a hospital, owing chiefly to absurd caste prejudices, a fair number have come in for operation. Others I know of will hold out until they can no longer endure the suffering. They are naturally encouraged in this course by the "Maiba" or Manipuri doctor, who practises an universal system of massage, generally abdominal, whether the case be one of cerebral tumour or vesical calculus. I know of an advanced case of phthisis being treated in this way, and so great is the patient's faith in it that he will not abandon it, although it oftener than not brings on a severe attack of hæmoptysis. But this is a digression.

The Manipuris state that those living in marshy spots, such as fishermen, are especially liable to stone. I have not yet had an opportunity of going into the matter.*

A CASE OF CONGENITAL PHIMOSIS WITH ENCYSTED PREPUTIAL CALCULI

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THE description in a recent issue of the *Indian Medical Gazette* of a similar case of this rare condition leads me to publish the following case of preputial calculi of which I have notes.

The size of the calculi and the fact that they were probably formed *in situ* seems to make the following case worthy of record.

Nanna, a Hindoo male, aged 45, was admitted into the Bulandshahr District Hospital on August 26th, 1903, suffering from difficulty in micturition.

The history he gave was of a very confused character. From his childhood he had been accustomed to trouble in passing his urine. These troubles became aggravated about a year ago when he began to have scalding pains during micturition. He was accustomed to pass his urine drop by drop, and there was ballooning of the prepuce with much pain during the act. He could not say when he first noticed the lump at the end of his penis. He had never had an attack of abdominal colic or of urethral pain, such as would be caused by the passage of a calculus through it. He had never noticed gravel in his urine.

On examination it was seen that there was a complete phimosis, the urethral orifice was so retracted under a fold of skin that it was not visible nor could it be found with a fine probe.

At the end of the penis, which was well developed and markedly lengthened, there was a well marked heavy swelling. This, on palpation, was found to consist of two separate masses, one the size of a hazelnut and the other about the size of a small walnut. A diagnosis of stone was made by obtaining a rough grating sensation on palpation, and it was thought that the two stones rubbed against each other, otherwise the case simulated very markedly one of hard malignant growth of the glans penis. With care, however, the glans could be differentiated from the lump.

Operation was at once performed and presented no difficulties, but it was found that what had appeared to be two single stones were in reality two masses of faceted calculi in separate sacs. A spurt of retained urine, when the cavity of the prepuce was incised, shewed the difficulty there must have been in passing it. There was very little preputial cavity left. Over about three-fourths of the glans penis, the glans and mucous membrane were inseparable. The calculi were found in two sacs, the walls of which were composed of thickened mucous membrane and the tissues of the glans. Both sacs communicated by small openings with the preputial cavity. As careful a circumcision as possible was done, and time should give the patient a fairly normal glans penis.

The calculi numbered over a hundred and were beautifully faceted. Their total weight was 3 diams 6 grains. The largest weighed 1 diam and the smallest a few grains. On section they were distinctly laminated, of light colour, and appeared to be composed of urates with some phosphatic deposits outside. If as I think probable these stones were developed *in situ*, it adds another to the text-book dangers of neglected phimosis. The possibility of mistaking a case of this kind for one of carcinoma should not be overlooked. In this case the diagnosis was made easy by the grating produced by palpation, otherwise it would have been very puzzling.



* Attention might too be directed to the diet of the Manipuris, is it chiefly rice, or wheat, maize &c.—ED., I.M.G.

Indian Medical Gazette.

OCTOBER, 1905

THE NEED OF A SCIENTIFIC LIBRARY
FOR INDIA

DURING the past dozen years from time to time complaint has been heard of the need of a library of scientific books and periodicals for India. At present we cannot be said to have any such thing as a good modern scientific library in India. What indeed have we in the way of medical libraries? We only know of the useful collection of books in the office of the Director-General in Simla. This consists of a large number of old volumes, of many bound sets of medical periodicals, and a good collection of modern books on the various branches of medical science, but these cannot be of use to the worker in India, they are necessary as works of reference for the Director-General himself. Doubtless the Pasteur Institute has by now a fine collection of modern periodicals and books on bacteriology. In Calcutta there is a Medical College Library for the use of the staff and the students, good as far as it goes, and there is a fair collection of old and new books in the office of the Inspector-General of Civil Hospitals, which books are available for use of Civil Surgeons in Bengal.

The Asiatic Society of Bengal has a fine collection of scientific books and especially periodicals, but the proportion of medical periodicals is very small and naturally so, as this great Society, though largely supported by medical officers, is in no sense a medical or even only a scientific society.

We have no exact information as to the resources of Madras and Bombay or Lahore, no doubt all the Medical Colleges have useful libraries for the use of their staff and students.

Something more than this is badly needed in India. A Central Medical Library containing all books of reference, periodicals relating to the medical sciences is what we need. Such a library should be centrally situated, it should consist of two parts, a library of reference and a circulating library. It should be in charge of a paid librarian, who should know sufficient of French and German to hunt out references, and if need be translate passages for workers requiring references.

The circulating library should possess several copies of all the best modern books on medicine, surgery and allied sciences, these should be available for medical officers all over India. An annual fee should be charged for the use of the library of small amount, and a deposit should be exacted against the value of books lent. There should be strict rules for the return and proper packing of books lent, and a limited period put as to the number of days or weeks a book lent out should be kept by the reader.

A nucleus of such a library would be obtained by the transfer of many books from some of the small libraries abovementioned.

Let us glance for a moment at the establishment of the library at Manila. This library commenced with a nucleus of only fifty books in July 1902, by May 1905 it contained 17,350 volumes. This consists of 250 periodicals in all branches of science, of the latest editions of scientific books published in Europe and America, copies of reports, etc. At first the library was to be for reference only, but owing to a growing demand at the beginning of 1904, arrangements were completed by which all persons employed in the various departments of Government might take out "borrowers' cards" subject to the provision of certain rules. A catalogue has just been published by Miss Mary Polk, the Librarian, and the library is now in a position of great usefulness, and the worker in Manila no longer feels the isolation and want of books of references which so greatly hinders the worker in the tropics.

We invite the opinions of our readers on this question of the need of a library for medical men in India. It seems to us the natural and indeed inevitable complement of the establishment of the research laboratories in India.

Current Topics.

THE BURMA SANITARY REPORT

THIS Report was sent in to Government eight days late, a fact over which the Burma Secretariat make moan in the first 13 lines of the Government Resolution. The Report has been written by Colonel R. Macrae, who for some six months held the appointment of Inspector-General of Civil Hospitals and Sanitary Commissioner in Burma, as in that Province the two appointments are still combined. The control of the vital statistics of Burma has

now been given to Civil Surgeons, who will be supplied with clerks to help them, formerly this work was in the hands of the Deputy Commissioners of the Districts. A greater check and better scrutiny as regards the classification of disease is expected, but one cannot be too hopeful as the accuracy depends upon the energy or ability of the village headman, who is certainly the weakest but also the most important link in the chain. If his "diagnosis" (God save the mark!) is wrong, what is right except the fact of a death? The birth-rate in Lower Burma is 32.7 per mille or less than the average, but it will surprise many to learn that the death-rate is only .223 as compared with a five years' average of 24.1 which compares very favourably with the death-rates in other tropical countries. The year 1904 was a healthy one, and there was no great prevalence of cholera. The Urban death-rates were higher, but varied enormously from 46 per mille in Kyaiklat and 40.9 in Pegu to only 15.4 in Insein, the latter figures being, however, doubtful. Some low death-rates are quoted for certain rural areas, but are accounted for by Colonel Macrae and due to defective registration. The infantile mortality is very high. Colonel Macrae compares the rate given for Burma 28 per cent with the 20 per cent in Bengal in 1903, both figures are of course terribly high. In addition to the usual causes bad midwifery is the cause of much of this great mortality. One Civil Surgeon believes that 30 to 40 per cent of women who die between the ages of 15 to 50 die from causes incidental (or rather which should not be incidental) to childbirth.

Cholera was much less prevalent than usual in Burma in 1904, one Civil Surgeon reports an outbreak of fatal ptomaine poisoning, due to eating the decomposed flesh of a bullock, and suggested that isolated outbreaks attributed to cholera may sometimes be of similar origin.

Small-pox had a death-rate of 24 per mille, vaccination is being pushed. A Civil Surgeon records a barbarous method of treating small-pox in one district, by the administration of powdered human bones and human excreta as a drink.

Plague had not become epidemic in Burma during 1904, but three cases were detected by medical inspection of steamers, one case came from the United Provinces, one from Chittagong District but had stayed two days in Calcutta, and one was a Goanese cabin steward. This shows how easily plague can enter a country, as it is impossible to detect cases in the incubation period. Since the beginning of this year plague has spread considerably over many districts in Burma.

Both in Upper and in Lower Burma there was a slightly less incidence of malarial fever, though the total rainfall was higher than in previous year, but as Col Macrae says "seasonal distribution" of rainfall is of greater importance

than total quantity. Malarial fever may be decreased either by a dry year or by a year of floods as can easily be understood, it is a year of normal distribution of rain, wet periods followed by dry "breaks" which produces a plentiful crop of both malaria and mosquitoes.

A few municipalities have started mosquito brigades, but there is a general feeling of hopelessness and despair with regard to the usefulness of such operations in Lower Burma and the delta area. This can be understood and will prevail until the Government in each province in India put aside a large sum of money to make a complete and thorough trial of anti-malarial measures in one or more selected towns and villages. Such an object-lesson is needed and if carried out intelligently and under expert medical supervision would prove successful. We may conclude our brief synopsis of Colonel Macrae's report by the following not pleasing picture of rural life in Prome—

"No progress in village sanitation can be recorded. Villagers without exception are apathetic and heedless of the filth of their surroundings. Cleanliness, however, can hardly be expected so long as the cattle are kept inside the village. In the rainy season the approaches to nine villages out of ten are blocked by morasses. Inspecting officers on tour do their utmost to get these filled up, but if the villagers are left to themselves they make no attempt at drainage and where there is no natural drainage slope, the village remains water logged and indescribably filthy throughout the rains."

THE BURMA HOSPITALS REPORT

THIS is a triennial report of the years 1902 to 1904. The ever present difficulty of obtaining subordinate medical officers in Burma has prevented the establishment of more dispensaries. That the hospitals in Burma are certainly increasing in usefulness and popularity is shown by the fact that while in 1899 the number of inpatients treated was just over 34,000 it has risen to over 50,000 in 1904. It appears, however, that there has been a falling off in the attendance of women and children, possibly due to defects in the hospitals, which it is satisfactory to know are being attended to.

The Rangoon General Hospital has fortunately been taken away from the Municipality, and has been since December 1902 under direct Government control. The new building, which has followed more or less the plan of the new Presidency General Hospital at Calcutta, will be a vast improvement and is estimated to cost 27 lakhs. The Inspector-General calls attention to the fact that there is no Police Surgeon in Rangoon, but his duties are apparently done by the Resident Surgeon of the General Hospital. It is too much to expect this hard worked officer to do his duty in the General Hospital and attend to 2000 police cases and over 150 post-mortems yearly.

* We hope soon to hear of the starting of such object-lessons in Bengal.

The Dufferin Hospital is apparently not doing all such a well found institution might do. Frequent changes of the lady doctors in charge doubtless account for the comparative non-success of the institution. It is to be hoped that the arrival of an English qualified Lady Superintendent will improve matters.

The diseases causing attendance on the hospitals are first malarial fevers, then worms, then ulcers and eye diseases. As usual cases of beri-beri are reported among the persons on the Lighthouses and Light vessels on the coast.

We quote the following fair and appreciative account of Capt Rost's work on Leprosy—

"*Leprosy*—The number treated for this malady in each year of the triennium is given as 138 in 1902, 934 in 1903, and 1,477 in 1904. This large apparent increase is due mainly to the fact that returns from the asylums of the province were not included in the figures for 1902 and only partially included for 1903.

In this connection mention may be made of advances alleged to have been made by Captain Rost, I.M.S., in the treatment of this disease. Captain Rost published a paper early in 1904 in which he claimed to have isolated and cultivated the bacillus lepræ and to have prepared, on lines similar to those followed in the manufacture of tuberculin, a vaccine to which he gave the name of "Leprolin." He subsequently treated several patients with this Leprolin, and claimed to have, if not actually cured some, greatly benefited them.

There can be no doubt that many of the patients treated fully believed in the relief afforded. I have ascertained this from personal enquiry.

Before, however, bringing Leprolin into general use, the Government of India considered that it should be subjected to further tests, and Captain Rost was deputed to the Bacteriological Laboratory at Kasauli for this purpose.

The report of his work there is now awaited.

If, as he claims, Captain Rost has discovered a cure for this disease, he will have conferred incalculable benefits on an unfortunate section of humanity.

In any case I consider that he is entitled to much credit for his attempts in this direction and for his zeal in undertaking this work entirely on his own initiative and in addition to other onerous and responsible official duties."

Mention is made of the prevalence of *Kwena*, or Yaws in the Chindwin districts, and we hope that the report of the Civil Surgeon referred to on this subject will be published.

We quote the following remarks of Col Maciae on the surgical work of the Burma Hospitals—

"*Operations*.—The total number of surgical operations performed during the year was 24,280 as compared with 23,086 in 1903 and 22,410 in 1902. The number of deaths and death rate for each of the years was as under

	Deaths	Deaths rate
1902	144	64
1903	89	38
1904	124	51

While there was a numerical advance in the total number of operations, analysis of the statement shows that important operations have been few and in some instances show a decline. This province in respect of operative surgery compares very unfavourably with every province in India. I am as yet unable to say to what special reasons this may be attributed. I notice in this report for 1899 it is stated that one reason why Burma is backward in the matter of surgical work is

'that Civil Surgeons devote an undue proportion of their time and attention to jail duties to the detriment of their more legitimate hospital work.'

I have reason to believe that the surgical equipment of a considerable number of the hospitals is extremely defective, that instruments are antiquated, operation rooms bad, and appliances considered essential by modern surgeons, in many cases non-existent.

I hope that improvements will be pushed forward, and that this state of things will have soon disappeared.

The number of cataract and stone operations in this province is insignificant. Both of these add largely to the totals in other provinces. It is said that these diseases are comparatively rare. I do not quite see why cataract should be a rare disease especially in Upper Burma.

A total of 40 lithotomy operations were performed and only 16 litholapaxy. It is possible that many hospitals have no litholapaxy instruments. It is only on this assumption that the proportion of lithotomy operations is explicable, as nowadays the litholapaxy operation has practically superseded it.

The hospitals in which most surgical work was performed were Rangoon, Mandalay, Moulmein, Thayetmyo and Bassein. The officers who performed the most important surgical work were Lieutenant Colonel Rundle, Major Russell, Major Pridmore, Major Duer, Captain Rost, Captain Barry and Captain Williams.

Dr Wells also performed some important operations."

THE "BARSATI" OF HORSES—A FILARIAL DISEASE

A VERY interesting and useful pamphlet has been published by Prof A Lingard, M.B., D.P.H., of the Muktesai Laboratory on *Barsati*, that strange disease of the skin and connective tissues in horses which is well known in India.

Dr Lingard's pamphlet deals with his observations on filaria embryos which are to be found both in horses and in cattle. He concluded from a large number of observations that filaria embryos are present in the blood of affected animals in varying numbers during the 24 hours, that a marked increase takes place in the number of embryos in most of the affected animals in the latter part of the day, i.e., from 6 to 10 P.M. It was also noted that the number of embryos was markedly less in September as compared with June and July.

These embryo filariae are found chiefly in 'country-bred' horses, but also in Arabs and 'Walers'. In the Punjab it was not unusual to find as many as fifty in a cover-glass specimen of blood, and Dr Lingard calculated that the total number of filaria embryos in a horse weighing 600 lbs., must reach the startling total of 1079 millions. The mature filariae have their habitat in the walls of the larger arteries, where they can generally be found with ease.

It is possible for enormous numbers of these embryos to circulate in the peripheral blood without causing any serious symptoms or any cutaneous lesion. These embryos, however, may entirely disappear from the blood and it appears that they become lodged in the interior organs and become calcareous nodules, which may be found in the lungs, liver, kidneys. Now one of the characteristic features of a *bursati* sore or ulcer is the presence of light yellow coloured granules

the so-called *Kunkur*. These *Kunkur* nodules have been found to be made up of large number of embryos clumped together, and it is believed by Dr Lingard that these parasites are the cause of the disease *bursati*. We commend this admirable pamphlet to our readers. It contains a vast amount of information on the filaria in bovines and equines, which is of special importance to medical men on account of the prevalence in many countries of filariasis.

PLAGUE IN QUEENSLAND

THE *Journal of Hygiene* (July 1905) contains an article of some interest on plague in Queensland by Dr C C Baxter-Tyrie. There were in Queensland in the year 1900, 56 cases, the disease having been introduced from Sydney, there were 36 cases in 1901, 82 cases in 1902, 21 cases in 1903 and 29 cases in the first half of 1904. Most cases were associated with "the handling and distribution of produce." There had been no case of plague in Brisbane from 11th September, 1903, till February 9th, 1904, and no infected rats from 28th September, 1903, till January 8th, 1904.

There is no evidence of importation, but the writer makes the rather wild suggestion that new gunny bags "made from material served out by the factories to natives who make it up in their own hovels where plague infection is ripe" may be the source of infection.

The following figures are of interest, since 1902 over 14,700 rodents (rats and mice) have been examined in Brisbane and 313 found infected, i.e., a percentage of 2.1 of rodents infected. In spite of his hint about Calcutta and Bombay gunny bags, Dr Baxter-Tyrie admits that "endemic maintenance and dissemination of the disease by rats are the main causes of the annual outbreak of plague" in Queensland. In view of Simpson's statement, in his Hongkong Report (1903), that the plague bacillus is in the mucus secretions of infected rats and mice (20 to 30 per cent), it is believed that contamination of food is the chief mode of rat to rat infection. In Queensland February to June is the period of maximum incidence, and rainfall is usually followed by an increase of cases, because the rain drives the rats from sewers and drains into buildings, &c, frequented by men.

Our author says that the experience of rat and cleansing gangs shows that the transmission of the disease by fleas is "much over-estimated." We note that the bonus paid for rats was sixpence and for mice threepence. In India it would pay men to breed rats at this high rate of bonus.

SO-CALLED MALARIAL NEUROSES

MANY of our readers will have seen in the *Practitioner* (August 1905) an article by Dr F Hare, Inspector-General of Hospitals, Queensland,

in article on malarial paroxysmal neuroses, which we feel bound to notice.

As our readers are well aware there was a time when a very large number of affections were conveniently grouped under the comfortable word "malaria." The progress of knowledge had led to a very great restriction of the use of this term, not only as applied to cases of pyrexia, but in the use of the word malaria as a cause of various obscure ailments. We venture to think that even the London consultant has now ceased to comfortably murmur "a touch of malaria" when a patient from the tropics consults him for some not very definite complaint. We have known a case of alcoholic hepatitis attributed in this way to a "return of your Burman fever." Now in Dr Hare's article, we notice a good deal of this sort of etiology. He says "asthma may depend on malaria" and quotes Norman Chevers and Morehead in support. But surely something more than the fact that the patient had a big spleen and improved "on iron and quinine" is needed before nowadays we can accept a malarial origin for asthma. It would need proof to believe that "Angina pectoris may depend on malaria." What evidence is there that "there is a well marked malarial epilepsy?" Epilepsy is doubtless a fairly common complaint in India, but if it was dependent on "malaria" it would be infinitely more common.

Again Dr. Hare says the "existence of malarial neuralgia does not require to be substantiated," but what proof is there of "malaria?" It may be intermittent but so is toothache, it may now and then be cured by quinine, but neuralgia in England is sometimes cured by the same drug. Gastralgia, Raynaud's disease, temporary amblyopia, erythromelalgia, and even urticaria may also, according to certain authors, depend on malaria. These are doubtless due to pathological vasomotor action, but we object strongly to their being classed as "malarial," unless it is clearly defined what is meant by "malaria." The mere fact of a present or previous residence in a country in which malarial infection exists, or of evidence of periodical recurrence or of curability by quinine is no proof of a malarial origin, even though the statements are supported by quotations from writers on Indian disease. What is needed is to show a connection between these ailments and infection by the malarial parasites and this has not been done.

REPORT OF THE YELLOW FEVER INSTITUTE

A USEFUL and interesting report has been published (Bulletin No 14 of the U S Public Health and Marine Hospital Service) on the work done by working party No 2 on yellow fever and malaria in Mexico. We may give the following summary of the report.

"The cause of yellow fever is not known. The *myxococcidium stegomyia* is not an animal parasite. Yeast cells sometimes simulate the coccidia in form and staining reaction.

The infection of yellow fever is in the blood serum early in the disease.

No abnormal elements that bear a casual relation to the disease can be detected in the serum or in the corpuscles with the best lenses at our command.

The infective principle of yellow fever may pass the pores of a Pasteur-Chamberland B filter.

Particles of carbon, visible with Zeiss lenses pass through both the Berkefeld and Pasteur Chamberland B filters.

Because the virus of an infectious disease passes a Berkefeld or Pasteur Chamberland B filter, it does not necessarily follow that the parasite which passed the filter is "ultramicroscopic," or that it may not have elsewhere another phase in its life cycle of large size.

The filtration of viruses may succeed or fail, depending upon the character of the filter, the diluting fluid, the pressure, time, temperature, motility of the particles, and other factors.

The period of incubation of yellow fever caused by the bites of infected mosquitoes is usually three days, sometimes five days, and in one authentic instance six days and two hours; but when the disease is transmitted by such artificial means as the inoculation of blood or blood serum the period of incubation shows less regularity.

Yellow fever may be conveyed to a non-immune by the bite of an infected *Stegomyia fasciata*, but the bites of *Stegomyia* which have previously (over twelve days) bitten cases of yellow fever do not always convey the disease.

Fomites play no part in the transmission of the disease.

The tertian and estivo autumnal malarial parasites will not pass the pores of a Berkefeld filter.

We have demonstrated a poison in the blood during the chill of tertian infection which, when injected into another man, caused chill, fever, and sweating. This poison, while present in a case of tertian during the rise of temperature, could not be demonstrated in the blood of a case of estivo autumnal fever during the decline of the paroxysm. While this poison reproduced the symptoms of the disease, still the data are too limited to consider it the malarial toxin.

Stegomyia fasciata is a domestic insect. It is most active during the day, but will bite at night under artificial light. The female lays eggs at intervals, the maximum number of eggs laid by one insect observed by us was 101. The mosquito does not always die directly after ovipositing.

Stegomyia fasciata may bite and draw blood from cadavers, although the danger from spreading the infection from this source is remote.

Male and female *Stegomyia fasciata* may pass a screen containing 16 strands, or 15 meshes to the inch, but not one of 20 strands, or 19 meshes to the inch.

Tobacco smoke produced by burning two pounds per 1,000 cubic feet with an exposure of two hours is sufficient to kill *Stegomyia fasciata*. This method is objectionable on account of the yellow stains and disagreeable odor.

Pyrethrum burned in the proportion of 1 pound per 1,000 cubic feet with an exposure of two hours will stupefy *Stegomyia fasciata*, it required 2 pounds to kill them outright.

From the limited number of experiments made and from previous experiments, we consider sulphur dioxide the best of the gaseous insecticides for this purpose.

Formaldehyde gas is not an insecticide, and therefore not applicable.

THE NATURE OF PARATYPHOID FEVER

The following excellent summary of Dr. H. Fox's article in the Pennsylvania Bulletin appears in the *Medical Chronicle* (August 1905).

"The object of this paper is to trace the relations of, and classify in order, typhoid fever, paratyphoid fever

paracolon infection and meat poisoning by reference to the literature, to which is added some work of the writer. The writer considers the true typhoid fever, no matter what its manifestations, but in which the etiological rôle of the *B. typhosus* is undoubted, as typhoid or enteric fever or typhus abdominalis. Its next relation whose etiology is the 'A' type of paratyphoid bacillus he calls the paratyphus infectiosa, and the organism the *B. paratyphosus infectiosa*, or 'B' paratyphosus 'A'. Because of the greater septicæmic character of the cases whose etiology is the 'B' type of paratyphoid bacillus, he suggests the name of paracolon septicæmia, and an analogous name for the bacillus. The cases partaking of both characters are thereby considered as transitional types varying in like manner as do the various members of the groups. From a consideration of all the facts in his general review of the position of paratyphoid fever, Fox offers the following conclusions—

1 Paratyphoid fever differs from typhoid fever in (a) a shorter invasion stage and rise of temperature, (b) shorter or absent period of continued fever, and (c) marked diurnal remissions of temperature, much deeper than enteric and without periodicity. An absence of the Widal is suggestive if it persist in reasonably high dilutions.

2 The duration is on the whole shorter than typhoid, and in the cases where Type 'B' was adjudged the etiological rôle this fact is more striking than in the Type 'A' cases.

3 The general findings of the Type 'A' cases are nearer to typhoid than Type 'B,' the latter presenting a picture more like septicæmia.

4 The complications of Type 'B' infections are more numerous, more purulent, and the course is more fulminating in these cases.

5 The casual germs belong to the intermediates of the typhocolon series, the Type 'A' being nearer to the bacillus of Eberth and Gaffky, while Type 'B' approaches the meat-poisoning group.

6 The clinical evidences of the respective organisms just named agree with their general properties and relations to infections in this order, ranging from the subacute typhoid to the hyperacute meat poisoning.

7 Antityphoid serum will clump the paratyphoid 'B' at the same time as the *B. typhosus*, sometimes even in higher dilutions, so that a positive reaction of a patient's serum to both *B. typhosus* and paratyphosus 'B' even if the latter be in higher dilutions, will not permit a diagnosis. On the other hand, only twelve times in 94 cases of fever did the serum react with the Type 'A' paratyphoid, so that a positive reaction with Type 'A' and not with the bacillus of Eberth may be taken as nearly a proof of the existence of an 'A' paratyphoid infection.

8 That there must be some other factor responsible for co-agglutinations than an increased value of the agglutinins normally present in the blood seems probable.

THE BRITISH MEDICAL BENEVOLENT FUND

WE have recently received the annual report for 1904, of the British Medical Benevolent Fund. The objects of this Society are to afford immediate relief to distressed members of the Medical Profession, then widows and orphans, and to grant annuities to members of the same classes over sixty years of age. During the year 1904 relief was given, in grants varying from £5 to £15, to 137 persons, and £1,533 was thus expended. The number of annuitants is 121, of whom 23 received annuities for the first

* We are not responsible for the Latinity of these titles, D, I M G

time in 1904, the oldest annuitant dates from 1882. The amount granted to each annuitant is, in the great majority of cases, £20, a few get only £10 or £15, a very few get £26 a year.

A list of applicants for temporary relief is given, with a short description of the circumstances under which relief was required. It discloses an appalling picture of misery in the medical profession, and more especially among families of deceased members who have died without making, often without being able to make provision for those left behind.

Going through the list of subscribers and donors, we find the names of thirteen members of the I.M.S., of whom eleven are on the retired list, and two of these eleven have died since the list was published. The late Surgeon Major H. de Tatham, of the Bombay Service, also left a legacy of £100 to the Fund during 1904.

"Donations and subscriptions are earnestly solicited, and will be thankfully received by the Treasurer, Dr Samuel West, 15, Wimpole Street, London, W., the Honorary Secretary, W. E. Sargent, Esq., St Bartholomew's Hospital, E.C., and the London and County Banking Co., 21, Hanover Square, W."

We who belong to the services are fortunate in that we earn good pensions, and are not likely to suffer want after retirement, while the Indian Family Pension Fund provides widows and children with pensions which, if not large, are at least sufficient to keep them above absolute want,—pensions which would seem wealth to all of the unfortunate applicants to the British Medical Benevolent Fund. In this connection, however, we may call attention to the fact that Government have recently had to impress upon officers that they are personally responsible for reporting to the Fund officials such events as marriage, or the birth of children. In two recent cases, it is noted, officers lost the benefits of the Fund for part at least of their families, owing to the birth of children not having been reported previous to the father's death.

THE Journal and Proceedings of the Asiatic Society of Bengal, Vol. I, No. 2, 1905, issued on July 18th, 1905, contains a list of the members of the Society as it stood on 31st December 1904. This list contains the names of 23 medical officers, most of whom, as might be expected, are in Civil employment in Lower Bengal. Of these 23 officers, 18 are members of the Bengal Service, and are a retired member of the same service. The other five consist of one Madras officer, one Bombay (retired), one of the new I.M.S., and one Uncovenanted Medical Officer on the retired list. A good many more I.M.S. men, however, have joined the Society since the beginning of the current year.

READERS of *The Practitioner* (August 1905) will remember the short paper with the heading "Oedema of feet and legs due to excessive ingestion of Sodium Chloride." The patient was a medical man who had got into the habit of taking from 300 to 600 grains of salt per diem. With difficulty he was persuaded to reduce the amount and he recovered. The writer of the article Dr J. H. Bryant, of Guy's, states that an average amount of salt is 150 grains. It seems as if there was a very great difference of opinion on the amount of common salt necessary. Lewis and Balfour (*Public Health*, p. 253) say that "an ordinary mixed diet [European] contains as much salt as is required for the needs of the body without its additional use as a condiment, about 2 grammes daily being all that is required," i.e., only thirty grains. Do orientals who are chiefly vegetarians require so much salt as they use? In prisons in India the allowance is from $\frac{1}{2}$ to 1 oz. in the various provinces. This is far in excess of the two grammes or even of the 150 grains mentioned above. The oriental is a halophagist, and often suffers from oedema of feet, generally attributed to malaria, &c.

WE have received a large pamphlet giving a full description of the splendid laboratories recently established in Manila by the United States Government.

WE have not been able to obtain a copy of the Kassauli laboratory report on the attempts made by Capt. E. R. Rost, I.M.S., to cultivate the leprosy bacillus, but to judge by the extracts quoted in the lay press the report was couched in language of considerable vehemence, showing rather the possession of a "masterful vocabulary" than sympathy for the isolated worker.

WE note that in a recent speech Sir James Bourdillon, the Resident at Mysore, and for many years a prominent officer as well as an acting Lieutenant-Governor of Bengal, said that "in regard to medical institutions this part of India (Mysore) was far in advance of Bengal, and the number and efficiency of the Hospitals in Southern India was incomparable."

WE quote the following note from the Report of the Yellow Fever Institute (Bulletin No. 14).

"It is of considerable practical importance in quarantine and public health work to know the size of screening that will keep out the *Stegomyia fasciata*, and as no accurate observations upon this subject had been made with which we were familiar, we conducted a few experiments to determine this point.

Screens with a varying number of meshes to the inch were placed over breeding jars, and banana, sirup, and other food placed on the other side so as to tempt the hungry insects to pass through. These experiments

were arranged by placing the fruit and food in a jar which was inverted over the breeding jar. A piece of gauze or netting was inserted between the two jars so that the *Stegomyia* would have to pass through its meshes in order to appear in the upper jar.

We found that both male and female *Stegomyia* may pass a wire gauze containing 16 strands or 15 meshes to the inch, but could not pass 20 strands or 19 meshes to the inch. It is evident therefore that the large meshed mosquito-bars ordinarily used in this latitude [Mexico] would not offer proper protection, and that window screening must also be of a finer wire than is sometimes employed."

This is a point of practical importance and it is very desirable that some one should repeat these experiments in India using wire gauze of the British standard sizes.

Reviews

Lhasa and its Mysteries.—By L. A. WADDELL, LL.D., C.B., C.I.E., F.R.S., LIEUT.-COL., I.M.S. London: JOHN MURRAY, 1905. 200 Illustrations and Maps.

WHEN the announcement was made that Lieutenant-Colonel Waddell was appointed P. M. O. and Antiquary to the Tibet Mission, it was felt by every one that this was entirely within the fitness of things. Lieutenant-Colonel Waddell has been known as a student of the religion and antiquities of Tibet for many years past and he is a recognised expert on the religion of Buddhism.

A book was therefore expected of him and he was not long in acceding to the expectation.

We have read at least three books on the recent Tibet Expedition and have no hesitation in saying that this is the book on the expedition and the one which will remain a record of this uniquely remarkable expedition.

It is neither our intention nor our duty to enter into a discussion of many phases of the Mission and the expedition which at the time gave rise to some controversy and criticism. Colonel Waddell's narrative is clear and easy-flowing and carries the reader along without strain. His descriptions of scenery are particularly good, as readers of his *Among the Himalayas* would have anticipated.

The notes of medical interest are not as many as we would have liked, but after all the book is written from a general and not from a medical point of view. Here and there we see glimpses of the work done by I.M.S. officers, such as the treatment by Captain T. B. Kelly, I.M.S., of cases of snow-blindness by adénalin, to relieve the intense congestion of the conjunctiva, or a word on the work of the hospital set up in Lhasa by Captain Walton, I.M.S., F.R.C.S. Of mountain sickness we hear something and we would like to have a record of the

experiments said to have been made on the chest measurements of plainsmen before and after entering the mountains. If any such records have been taken will some of our readers who have been up in Tibet give us a clue as to where to get them? Mountain sickness is aided by indigestion and this complaint was common enough owing to difficulties of cooking. The absence of scurvy is satisfactory, and is attributed to the regular issue of fresh meat throughout the Campaign. Frostbite, says our author, was not so frequent or severe as was expected. We are not impressed with the theory of the origin of pneumonia put forward in page 141 of the book. It was said to be most common among men exposed to night sentry and picket duty, but we would have thought that the concentrated foul air of huts and tents without ventilation, would have been a more potent predisposing cause. Possibly consideration of official secrecy prevented the inclusion in this volume of a full account of the medical work of a campaign, so unique in many ways. We regret the absence of such, which would have been of value and interest to more than medical men, yet perhaps we should remember the predilections of the distinguished author, and the fact that the book purposes to give an account of Central Tibet, its Capital, its Lama hierarchy and its dreamy hermit people as they appeared to one who had certainly exceptional advantages for making their acquaintance.

We repeat the book is the best we have seen on Tibet and the famous Mission. It is beautifully illustrated, handsomely got up and will, we hope, remain for long as a record and a souvenir of one of the most remarkable expeditions of the British army of India.

A Text-book of Legal Medicine.—By F. W. DRAPER, M.D. Philadelphia and London, 1905. W. B. Saunders & Co.

THIS volume on legal medicine is from the pen of Dr. F. W. Draper, the Professor of Legal Medicine at Harvard University and Medico-legal Pathologist to the Boston Hospital.

The author has had a very considerable experience of medico-legal work, and though in the volume he freely quotes from the standard authorities, especially Taylor, yet he supplements these with many cases from his own experience.

The volume follows the usual lines of books devoted to this subject. The chapters on sexual offences, rape and abortion, are particularly thoroughly dealt with and their perusal will be of benefit to any medical men who have such a case on hand. The chapters on wounds and on blood-stains are extremely good and well illustrated. With regard to the serum method of identifying human blood, Dr. Draper has adopted a wise and conservative attitude. This method when proved beyond all reasonable doubt will

certainly be of the utmost value, and we hope that this will soon be effected, till then it is better avoided by the ordinary practitioner who has to give evidence in a case where a man's life is probably at stake.

There is a useful chapter on the symptoms and effects of an electric shock and on deaths from lightning. A final chapter on a medico-legal autopsy is excellent.

We may say at once that we were very favourably impressed with this book. The language is clear and concise and the experience of the author makes it authoritative.

Diet in Health and Disease—By J. FRIEDENWALD and J. RUHRAH, Philadelphia and London, 1905. W. B. Saunders & Co.

THIS book has been prepared by the authors to meet the needs of the general practitioner, as well as the student. Its aim is entirely practical. An account is given of the various kinds of food, their uses and composition, but the greater part of the book is devoted to an important subject, one which every practitioner feels he should know, viz., how to feed his patient. It is this portion of the book which will attract readers, and it is one on which but few books exist in the English language.

After 146 pages devoted to a consideration of the various articles of food, such as our readers are accustomed to in Parke's *Hygiene* and its modern substitutes, we come to a chapter on the preservation and cooking of food, and on diets for singers, speakers and athletes. There is a chapter on infant feeding, on the diet for the aged and for women during pregnancy. Then comes the remaining 400 pages of the book on the diet in disease, in the specific fevers, in diseases of the stomach (very good and complete), in intestinal diseases, etc., etc.

The final chapters are devoted to army and navy rations to dietaries in public institutions, prisons and hospitals, and the volume concludes with numerous recipes, diet lists, etc., etc.

It is a most complete and comprehensive book, and should prove of great value to the practitioner.

Diseases of the Rectum and Anus—By GOODSALL AND MILES. Longmans and Green.

THIS is the second part of a work of which the first part was published in 1900. As we then remarked, it reflects the surgical practice of St Mark's Hospital and must on that account command the attention of all surgeons. The first part was so eminently practical, so lucid in its exposition and so satisfying in its detail, that we looked forward with pleasure to the completion of the work. We regret to observe that this belated second part does not come up to our anticipations.

The first two chapters deal with prolapse and invagination of the rectum. Some nice verbal

distinctions are made in the varieties of prolapse, but it is not sufficiently insisted on that each of the varieties may and often does pass into a higher degree of prolapse, and also that an invagination may pass into a true prolapse. We are therefore unable to see the wisdom of the recommendation of left inguinal colotomy for an extreme degree of invagination. If excision is suitable for extreme and otherwise incurable prolapse, it is hard to conceive of the reasons that lead the authors to recommend the more heroic measure for invagination.

In the third chapter all the usual forms of ulceration are described. Under the title of Infective Ulcer the authors have been pleased to describe what they seem to think is a form of ulceration due to the infection of wounds of the lower gut. Why they should consider it a specific ulceration even after two distinguished bacteriologists had failed to find anything more specific than a form of the B. coli is more than we are able to understand any more than we are able to understand why they are inclined to suppose that this so-called specific ulceration is to be traced to the East where the authors have been told that infective ulceration is a very common sequel of operations on the rectum. It is a pity we are not given authority for that statement which we are disposed to question. Unless we are very much mistaken, this so-called infective ulceration of the rectum is nothing more or less than what we have been accustomed to know under the name of follicular ulceration, and it is to be noted that this latter finds no place in the authors' classification of ulcers.

In the chapter on stricture, which is otherwise excellent, we find a quaint admission of ignorance under the garb of an original observation. Our authors' acquaintance with gynaecology is obviously limited, for it seems to have come to them as a revelation that one form of stricture common in women is due to the fact that the two utero-recto-sacral ligaments are apt to become infiltrated in pelvic inflammations and by subsequent contraction to induce stricture.

Some valuable practical hints are given in the chapter on malignant growths, but we are unable to agree with the authors that it is always desirable to attack these growths by the sacral route or that a preliminary colotomy should always be performed.

The experience of the authors in the treatment of pyruitis ani has been more favourable than that of most practitioners, and it is therefore not to be wondered that we find no mention of the operation that Ball has recently advised for intractable cases, but as the book is for the most part a record of personal experience and practice, we have no right to expect more than we actually find.

The publishers have done their best to bring out the book in excellent form. Print and paper are excellent, and the illustrations are abundant and good. The latter are mostly from

photographs, some of which are wanting in the definition that is to be desired in a work of this nature. If our praise of this second part of the authors' work has been scant, it is because the volume does not seem to us to be up to the level of excellence of the first part, but for all that it is a contribution to the literature of rectal disease that will we think take a permanent place.

Current Literature.

PUBLIC HEALTH

I

NOTE BY DR J NIELD COOK, D.P.H.,

The Health Officer of the Corporation of Calcutta, on the use of Copper as an Algicide and Germicide

DR GEORGE T. MOORE, who is in charge of the Laboratory of Plant Physiology at Washington, U.S.A., has written some interesting papers to show a remarkable action of copper sulphate in small quantities in purifying water by killing algae and bacteria without injuring the higher forms of vegetable life, or fish, or human beings drinking the water. Drs Rideal and Baines in England tested and to a large extent confirmed his conclusions. Lieutenant S. R. Christophers, i.e., Superintendent, King Institute of Preventive Medicine, Madras, has since done some experiments which were published in the *Indian Medical Gazette* for April which throw doubt on these results so far as their applicability to conditions prevailing in India is concerned, and though I have read in *Capital* and elsewhere of perfectly satisfactory results being obtained in the case of particular tanks, after a number of carefully conducted trials with measured quantities of the chemical, I am reluctantly forced to the conclusion that copper sulphate in the quantities generally prescribed by Drs Moore and Kellarman is of little practical use for the purification of the filthy tanks that abound in Calcutta.

2 As the amount of copper sulphate said to be required to kill different algae varies enormously, from 1 in 25,000,000 in the case of *Spirogyra* to 1 in 100,000 *Beggiatia* (the sewage fungus), I thought it advisable before proceeding to its use to ascertain so far as I could what algae I had to deal with and become familiar with their appearances. But as the fauna of our tanks have, so far as I am aware, never been worked out systematically and I had difficulty in obtaining even English books of reference to help me, I cannot claim to have done more than identify a few genera and species which were of special importance in connection with this work. Some of the tanks in Calcutta are covered with a healthy vegetation such as duckweed, or *Lemna*, which is said to afford shade for the fish and to generally prevent the breeding of anopheline mosquitoes, and one or two larger species of aquatic plants. Some varieties of water lilies are also found. On sanitary grounds there is no reason to interfere with any of these growths, and I have found that copper sulphate in ordinary quantities has absolutely no effect on them. A noticeable feature of many of the tanks is a green scum on the surface, which rises and sinks with the sun. In some cases the scum appears to have been dusted over with a bright green powder. This condition appears to be produced by the *Cyanophyceae*, or *Phycocromophyceae*, the blue green algae. Sometimes with reflected light they have quite a red colour especially when they have begun to decay. They must liberate oxygen and have some effect in purifying the water, but when they die and decompose they give off

an unpleasant odour. They mostly consist of separate roundish cells embedded in a gelatinous matrix. The native fishmen consider that they are good for fish by affording shade, keeping the water from getting too hot and probably affording food, as many Indian fish, even including the royal Mahseer, feed largely on moss or algae. I identified some varieties of this order such as *Celosphaerium*, *Clathrocystis*, *Microcystis*, etc. I also found filamentous forms of growth such as the *Oscillatoria*. The small and actively motile *Euglena* with its bright green body and red pigment spot like an eye in front is common in the tanks at certain seasons, even after treatment. I have seen the water quite green with it. Under the microscope it is quite a pleasing sight to see them darting about like small emerald torpedoes. Their extreme mobility might lead one to mistake them for animalcules which they have been supposed to be, but, as they manufacture protoplasm out of inorganic salts by means of their chlorophyll they have finally been relegated to the vegetable kingdom and no zoologist will recognise them. A number of *Diatoms* and *Desmids* are to be found, which do not closely concern this inquiry, and in one tank with comparatively clean water I found large quantities of a species of *Chara* which is popularly known as a stone wort and is, I believe, used for clarifying sugar from the date palm. There are of course countless bacteria in our tanks and a large number of the lower animal forms from *Protozoa* to *Crustacea* are to be seen under the microscope, some of them such as the *Vorticella* and allied species being of great beauty.

I first tried the effect of copper sulphate as an algicide in the laboratory. The following two experiments are fair examples of the results obtained—

(1) Two tall glass cylindrical vessels of one litre capacity were filled with tank water with a layer of blue green algae forming a scum over the surface. The following algae were found in the water. The figures opposite them show the number of parts of water to one part of copper sulphate recommended by Messrs Moore and Kellarman for their destruction.

<i>Clathrocystis</i>	8,000,000
<i>Celosphaerium</i>	300,000
<i>Oscillatoria</i>	5,000,000
<i>Microcystis</i>	1,000,000

A solution of copper sulphate in filtered water was made 1 in 100, and 1 cubic centimetre of this solution containing 0.001 gramme of copper sulphate, was poured on the surface of one of them, the other being kept untreated as a control. This made the amount of copper sulphate in the vessel 1 in 100,000. After 24 hours some of the algae were somewhat discoloured, but as they still appeared to be growing after 48 hours a second dose of .1 cc of copper solution was added and the contents of the glass were thoroughly stirred. This appeared to kill the algae in 36 hours when most of them were found to have fallen to the bottom as a brownish deposit, but the water did not become clear. The control still showed algae growing on the surface.

(2) Two vessels were filled with tank water with blue green algae as before and to one of them sulphate of copper solution was added to make a dilution of 1 in 500,000. Not much change was observed on the first three days, on the fourth there was a good deal of discoloration, the water became greenish in colour from the diffusion of the pigment, and on the 5th most of the algae fell to the bottom forming a brownish deposit. The water was kept for some weeks, but never became clear, though it showed some improvement.

3 I read in the Monograph of Messrs Moore and Kellarman that the concentration necessary to kill algae in the laboratory is from 5 to 20 times as great as that necessary to destroy the same species in their natural habitat. So I expected to get good results with proportionally much smaller amounts of the copper salt in tanks than I had used in the laboratory. The method generally employed in treating tanks was to

the 11b bags of copper sulphate round the neck of an inverted chatty, which acted as a float, and pull it slowly backwards and forwards on the surface of the water in parallels about 3 feet apart until all the salt was dissolved, which usually occurred in 40 to 50 minutes. The float was attached to the middle of a long rope and two men on opposite banks pulled it from one to the other and back again. A boat or punt was tried in one case and a kerosine tin as a float in another but on the whole I prefer the chatty and cord to anything else if the tank is not so large as to preclude its use and make a boat or raft indispensable. In all seven tanks were treated, and I will give a few notes on each case.

A The first tank treated was the triangular tank at the junction of Wood Street and Park Street, about which many complaints of offensive smell were received after the work of filling it with ashes from the incinerator was commenced. It was reported to be so offensive that all the boarders had left two boarding houses in its vicinity. The water was not clear but contained no visible growth. The amount of water was estimated at 150,000 cubic feet and 6lbs of copper sulphate were used, making one part to a million and a half. No appreciable effect was produced either as regards the smell or the cleanness of the water.

B A Municipal tank in Hareh Chunder Mukerjee Street was the next treated, about which a complaint was received stating that owing to the growth of *pana* and other jungly weeds it had become a nuisance and danger to health, the malodour and bad gas emanating from the foul water making it impossible to keep doors and windows open. I found the tank overgrown with Lemna, duckweed, with jungly weeds in the shallows. There was some smell, but it was not very offensive when I saw it. The water was estimated to be 31,820 cubic feet. Oscillatoria and a few other small algae were found in the water, but no algae visible to the naked eye. 2lbs of copper sulphate were used, which is slightly over 1 part in a million. I inspected the tank on several occasions, but though it was subsequently treated a second time no visible or noticeable effect has been produced, though it is now about two months since it was treated. The microscope showed that some microscopic algae were killed.

C 82, Sikdarpara Road, Kalighat—This appeared a likely tank for the sulphate of copper treatment as it was covered over with unicellular blue green algae in a gelatinous matrix, the water was foul and there was a fishy smell emanating from it, but people were washing clothes and bathing in it. A correspondent wrote of it that the water was much discoloured and stench gas was continually emitted day and night. The cubic capacity of the water was 54,000 cubic feet, and 6lbs of copper sulphate were used on the 27th May, giving one part in 500,000. The condition of the tank was thus described a fortnight later by a pleader of the Alipore Judge's Court, who had the misfortune to live near it—

"The water of the tank was very bad before and was certainly not fit for use. The application of copper sulphate has, so far as I can judge, improved it in an appreciable degree, but formerly the surface of the tank was much cleaner and the atmosphere in contact with it was not surcharged with any nauseating smell. Now the application of the remedy has thrown up a large quantity of green frothy matter which covers the surface of the water in a layer of about half an inch thick. This substance begins to gather on the surface every day from about noon and is fully formed into a coating of green mantle in the afternoon, emitting a most intolerable stench which continues to poison the air until cooler night breezes have the effect of gradually precipitating the green matter towards the bottom so that very little of it remains on the surface in the morning time."

After numerous personal inspections and examinations of samples of the water sent to the laboratory I

can vouch for the literal accuracy of this description. On the top of the putrefactive mass described a fresh growth of living algae appeared, so the tank was again treated with copper sulphate on the 20th June. But up to the time of writing nearly a month later and nearly two months from the first treatment the state of the tank leaves much to be desired. I cannot say that from the point of view of a nuisance it is any better than it was before the treatment was commenced. I omitted to mention that the quantity of copper sulphate used killed some of the smaller fish. The rains have now set in and put an end to the experiment.

D 18, Sikdarpara Road—The water of this tank was yellowish green in colour and covered with a layer of unicellular algae in a gelatinous matrix. The measurement was about 33,412 cubic feet and 3lbs of copper sulphate were dissolved in it on the 27th May, which gives nearly one part of copper in 700,000 of water. In this case as in the last after treatment there was a putrefactive scum on the surface, principally on one side to which it was driven by the wind, and some time after treatment it was found to be swarming with *Euglena*. It was treated again on the 15th June which partially but not entirely destroyed the *Euglena* and appears better than the tank at 82, though when I visited it awhile ago an old Babu who lived there kept repeating to me that it was "a filthy cess pool." It is now nearly two months since the first treatment.

E Tank opposite the Lansdowne Road Market—The water of this tank had a thinner scum of algae on the surface with less matrix. The water was foul. It measured 22,950 cubic feet. It was treated on the 29th May with 2lbs of copper sulphate, or rather less than one part in 700,000. The algae practically disappeared in a few days, but a sample sent to the laboratory showed it to be of a yellow colour almost like a dye, owing probably to diffusion of the pigment phycoxanthine on the destruction and disintegration of the algae. A fresh growth of algae appeared in about a month and the tank was treated a second time on the 26th June. The algae have been thrown down as a brown deposit on the bottom but the water is not nice to look at.

F Tank at 57 1, Poddopuker Road—Measurement 35,700 cubic feet. Treated on the 29th May with 2lbs of sulphate of copper, or nearly 1 part in a million of water. This tank was very similar to the Sikdarpara Road ones, being covered with unicellular algae. After treatment it showed masses of putrefying algae giving off bubbles of offensive gas. This has not yet disappeared and a new growth is appearing. It is now seven weeks since the treatment.

G A large Municipal tank of comparatively clean water in Poddopuker Square, Lansdowne Road—This tank contained quantities of *Chara* and, as *Nitella*, a closely allied species of the order Characeae is stated by Messrs Moore and Kellerman to be killed by one part of copper sulphate in 10 million parts of water. I first tried one in 5 million and subsequently one in 2½ million, but without any ostensible result beyond apparently turning some of the *Chara* slightly yellowish in colour and some of the older leaves dropping off. I inspected it this morning (July 13th) nearly a month after the first treatment and a fortnight after the second and found that some of the plants were little more than stalk, but others still appeared healthy especially at the top, so considering the time that has elapsed the experiment cannot be considered to be a complete success.

4 The detailed work of the following experiments to test the efficacy of copper sulphate and metallic copper as a bactericide and larvicide was carried out in the Municipal Laboratory by Drs Dutt and Ghose.

Experiments with copper sulphate as a disinfectant water supplies—A series of observations was made with sterilised filtered water in test tubes, containing sufficient copper sulphate solution to make the strength 1 in 100,000, to which comma bacilli, *B. Typhi* and *B. Coli* were added. The test tubes were incubated at 36° C and agar tubes were inoculated after 4, 24 and 48 hours. A sporing

bacillus common in Calcutta filtered water was also inoculated to test the action of copper on this class of organism. After four hours all the above species were found to be unaffected. After 24 hours, the growth of B Typhi and B Coli was inhibited while the commas and the sporing bacilli were apparently unaffected. In each case control tubes which were not treated with copper sulphate showed a growth of the bacillus.

TABLE I

Effect of copper sulphate solution (1 in 1,000,000) upon Comma Bacilli, B Coli, B Typhi and a Sporing Bacillus inoculated in sterile filtered water

Kind of organism	No of Expts	After 4 hours	Control	After 24 hours	Control	After 48 hours	Control
Comma B	1	+	+	—	+	—	+
Do	2	+	+	—	+	—	+
Do	3	+	+	—	+	—	+
B Typhi	1	+	+	—	+	—	+
Do	2	+	+	—	+	—	+
Do	3	+	+	—	+	—	+
B Coli	1	+	+	—	+	—	+
Do	2	+	+	—	+	—	+
Do	3	+	+	—	+	—	+
Sporing Bacillus	1	+	+	+	+	+	+

To test the behaviour of copper sulphate in water containing large quantities of organic matter, a sample of tank water was sterilised and a solution of copper sulphate was added to make the strength 1 in 100,000. The chemical analysis of the sample of tank water gave the following results —

Results expressed in parts per 100,000

Free Ammonia	10
Albuminoid Ammonia	0.32
Chlorine	15.0

The water was yellow, uniformly turbid, smell disagreeable, reaction alkaline, with algae on the top.

The test tubes containing the sterile tank water were inoculated with B Coli, B Typhi, and Comma Bacilli and incubated at 36°C. Agar tubes were inoculated from these after 4, 24 and 48 hours, controls being kept for comparison.

TABLE II

Effects of copper sulphate solution (1 in 100,000) upon Comma Bacilli, B Typhi and B Coli inoculated in sterile tank water

Kind of organism	After 4 hours	Control	After 24 hours	Control	After 48 hours	Control
Commas of cholera	+	+	+	+	+	+
B Typhi	+	+	—	+	—	+
B Coli	+	+	—	+	—	+

Similar experiments were made with Hughli river water as pumped at Pulta, treated with copper sulphate solution (1 in 100,000) and the effect of the treated

+ Indicates growth after 24 hours' incubation

— Indicates no growth

* In the two experiments in which the commas were found not to be growing when inoculated after 24 and 48 hours, the tubes were inoculated from an old agar culture of the microbe

water on Comma Bacilli, B Typhi and B Coli is shown below

TABLE III

Kind of organism	After 4 hours	Control	After 24 hours	Control	After 24 hours	Control
Commas	+	+	+	+	+	+
B Typhi	+	+	—	+	—	+
B Coli	+	+	—	+	—	+

In all the above experiments the test tubes containing filtered tank and river water were inoculated with the different organisms after the tubes received doses of copper sulphate to make the strength 1 in 100,000.

To observe the behaviour of minute quantities of copper sulphate on the above pathogenic micro organisms, when these have grown for some time in sterile filtered water, tubes containing sterile filtered water were inoculated with Comma Bacilli, B Typhi and B Coli and incubated for 24 hours. After the microbes had thus got a start doses of copper sulphate solution were added to the tubes to make the dilution 1 in 100,000. Agar tubes were inoculated after 4, 24 and 48 hours and controls kept in each case. The effect is shown in table below —

TABLE IV

Kind of organism	After 4 hours	Control	After 24 hours	Control	After 48 hours	Control
Comma Bacilli	+	+	+	+	+	+
B Typhi	+	+	+	+	+	+
B Coli	+	+	+	+	+	+

None of the organisms appear to have been affected by the action of copper sulphate solution in the strength of 1 in 100,000, which shows that the above strength cannot kill these pathogenic organisms when they are present in very large numbers.

To observe the purifying effects of copper sulphate on water supplies measured quantities of filtered water from a tap were collected and poured in two sterile flasks. Immediately after collection one of the flasks received a dose of copper sulphate solution to make the strength 1 in 100,000, and the two flasks were kept at the room temperature. After four hours plate cultures with 0.1 cc and 0.5 cc of water were made from each flask and the plates incubated at 36°C. After 48 hours the plates were counted with the following result —

	Number of colonies per c.c.	
	with 0.1 c.c.	with 0.5 c.c.
Treated water	10	32
Untreated water	The whole surface overgrown. No colonies can be counted owing to large numbers of spreading colonies overlapping one another.	The whole surface covered with minute separate as well as spreading colonies.

Two test tubes containing McConkey's solution, which is used in the routine examination of the filtered water for B Coli, were inoculated with 1 c.c of water from the above flasks. The tubes were incubated at 42°C. After 24 hours the McConkey tube containing untreated

filtered water showed both reddening and fermentation, the tube containing treated water remaining unchanged. This shows that no bacilli belonging to the coli group were present in the treated waters.

All the above experiments show that a solution of copper sulphate in a dilution of 1 in 100,000 exercises bactericidal action on B Typhi and B Coli and some non-sporing bacteria but Comma Bacilli and spore forming micro organisms are generally unaffected. Even after four hours' treatment with a solution of 1 in 100,000 the number of bacteria in a water supply is considerably diminished and if it is contaminated with B Typhi and B Coli it may be rendered harmless by this means.

Experiments with copper and other metallic vessels as destroyers of B Typhi B Coli and Cholera bacilli and as general bacterial purifiers—

Three flasks containing sterile filtered water were inoculated with sterile water emulsions of B Typhi, B Coli and Comma Bacilli respectively, so that the water looked faintly hazy. The inoculated waters were poured into clean metal vessels, which were previously washed with boiling filtered water. The vessels were kept at the room temperature, and agar tubes were inoculated after 4, 24 and 48 hours, controls being kept at the same time. A similar experiment was also made with sterile tank water. The results are shown below—

TABLE V
FILTERED WATER.

	No of Expts	ALUMINIUM			COPPER			BRASS		
		B Coli	B Typhi	Comma	B C	B T	C	B C	B T	C
After 4 hours	1	+	+	+	A few colonies	+	+	+	+	+
Do	2		+	+		A few colonies.	+	—	+	
Do	3								—	
After 24 hours	1	+	+	+	—	—	+	—	A few colonies	+
Do	2		+	+		—	+	—	—	
Do	3								—	
After 48 hours	1	+	+	+	—	—	+	—	A few colonies	+
Do	2		+	+		—	+	—	—	
Do	3								—	
TANK WATER										
After 4 hours	1	+	+	+	+	—	+	+	—	+
Do	2						+			+
After 24 hours	1	+	+	+	+	—	A few colonies	—	—	+
Do	2						+			+
After 48 hours	1	+	+	+	+	—	—	—	—	+
Do	2						—			+

The above experiments show that both copper and brass vessels act on B Typhi and B Coli in filtered water as well as in tank water containing very large quantities of organic matter, and that water contaminated with these pathogenic micro organisms becomes sterile within 24 hours. But no such bactericidal action is observed to be exerted in the case of the cholera bacillus, which can be found alive even after three days. The metal aluminium has absolutely no action on any of the organisms experimented with.

Action of copper sulphate on mosquito larvæ—Water containing culx larvæ was treated with different strengths of copper sulphate solution. In the strength of 1 in 2,000 the larvæ were killed within 24 hours, though a few were still found alive. Dilute solutions of copper sulphate, 1 in 10,000, had no effect on these larvæ in 48 hours. After three days' action a few were found dead. After six days the water was found alive with these larvæ though dead bodies of numbers of them were found collected at the bottom. In the strength of

1 in 100,000 the majority of these larvæ were found living after six days. The pupæ of the culx were unaffected even by the strong dose of the 1 in 2,000, at which strength the water was coloured blue by the salt.

5 Conclusions—The above experiments show that the admirable results obtained in America with the use of copper sulphate to kill the alga which gave their water supplies a fishy odour and taste cannot be obtained with equal quantities of the salt in the case of the filthy tanks that are the despair of sanitarians in Calcutta, though there is no denying the fact that the copper exhibits a considerable algicidal action. Dr Moore gives one in a million as the maximum dose to be used, but in my experiments with the exception of the Chara tank it was the minimum amount used, and I used up to double that amount which was found to kill a few of the more weakly fish. I believe that if our tanks were repeatedly treated for some months with about 1 in 500,000 it would be possible to free them from alga, but it does not appear that it would purify the water or kill the bacteria more especially the cholera bacillus which is the one of all others that in the interests of public health it is desirable to get rid of, and which has been found to survive treatment with five times that amount. I am credibly informed that the fishermen like to have alga forming a scum over the tanks and put them into any tank that is not overgrown with them, so it would be of little use killing them if they replaced them as soon as our backs

were turned. Whilst they are growing the alga exercise a beneficial influence on the water and act as purifiers. But many of them when the cells burst discharge a sort of essential oil which imparts a fishy odour and taste to the water, though it appears to be quite harmless. Some of them like the Nostoc, which I have not found in Calcutta, have a very powerful odour, which is described as a "pig-pen odour." I remember a bridge over the Cooum river in Madras where at certain seasons the stench was worse than many pig pens, but inquiries showed that people who lived in the stench did not suffer in health though they found it an intolerable nuisance. In America the sulphate of copper treatment was specially directed to the purification of drinking water supplied to large cities which must in some instances have been in a very bad state, for we read in a Massachusetts report, "the odour was so bad that it would be almost impossible to take it as far as the mouth to taste it. Horses refused it at the street watering troughs and dogs fled from it," and from

Indiana we hear the "taste was said by the people to be woody or fishy, like rotten wood or decayed fish. At one time the report got out that the body of a missing man had been found in the reservoir." In Pennsylvania, "water smelled and tasted as if dead fish were in it." The struggle of the conservators with the algae in Texas reminds one of the celebrated sculptures of Laocoon and his sons wrestling with the sea serpents.—"At this time of year algae are fierce, some days we are on top and some days the algae are on top." If we had this condition in our settling tanks at Pulta, or if we had an epidemic of typhoid in the town that could be traced to the use of our town water, I should recommend energetic action with copper sulphate. Or, if the ornamental waters in the public gardens and squares were creating a nuisance that interfered with the recreation of their frequenters it would be desirable to employ this treatment. But I do not consider the results obtained sufficiently promising to warrant us in taking action to treat the water of the two thousand insanitary tanks scattered over the town. If any owners of private tanks wish to treat them our officers can advise them how to do it, and in exceptionally bad cases we may employ the treatment ourselves.

I am informed by the Inspector General of Civil Hospitals that copper sulphate has been tried on septic tank effluents, but that the amount required was so large as to make the cost prohibitive.

The action of metallic copper and in a less degree of brass in killing bacteria I regard as of academic interest rather than of practical utility, for if a man is thirsty, he is not likely to wait for 24 or 48 hours for his copper drinking vessel or brass *lota* to kill the possible typhoid germs which the water may contain, and even then he could not be certain of safety. As regards the destruction of mosquito larvae copper sulphate is infinitely inferior to other larvicide, and what ever agent is used the treatment must be repeated every week or ten days.

J. N. COOK, D. P. H.,

12th July 1905

Health Officer

Correspondence.

LARGE STONES IN THE BLADDER.

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In your issue for July you ask for opinions on this matter: at the end of a letter by Major Duer, I. M. S., reporting a large stone successfully dealt with by suprapubic lithotomy. I have, a short time since, gone over the annual sheets for the past five years of stone operations in the Punjab. One marked feature is that suprapubic cystotomy is still performed in the Punjab, and, I may say, that from the information at my disposal I am inclined to think that most of the cases could be safely dealt with by litholapaxy. The mortality of suprapubic cystotomy in the Punjab is now, and always has been, well over 40 per cent., an appalling figure when compared with the 10 per cent. death rate after lateral lithotomy in cases unsuitable for litholapaxy. I have little doubt that it is the teaching of the Edinburgh School which leads our junior operators to select the suprapubic—a route which very little experience induces them to cease and to give preference to litholapaxy or perineal lithotomy, both of which are long since established by Indian surgeons as safer than suprapubic cystotomy. The suprapubic route to the student sitting far off in the gallery of an operating theatre where he is supposed to see everything, but where as a matter of fact he can see nothing of the operation, and who as a consequence would be as well having his midday snooze, seems so much more simple than the perineal route. To the novice it is not more simple. It is a much more easily bungled operation than the perineal one, and, if not perfectly done, the consequences are very much more disastrous.

As to the best method of dealing with large stones, my own opinion—now based on considerable personal experience—is that Keith's operation, i. e., incising the urethra at the apex of the prostate and, by this route, using a much larger lithotrite than can be used by the penile urethra, and dealing with the stone thus by a perineal litholapaxy—

is, for stones impracticable for litholapaxy by the penile route and yet within reasonable dimensions, incomparably the best and most successful operation. The bladder is not incised and the sphincter of the bladder is not injured, and the results are remarkably good. By this route No. 20 or 22 instruments can be passed with ease. In this connection I would emphasize the importance of using the large lithotrite for only a few crushes and finishing up with smaller instruments. It is much easier to get hold of the fragments with smaller instrument. The term 'reasonable dimensions' is rather vague. A great deal depends on the condition of the patient and on his capacity for standing prolonged chloroforming. This must always remain to be decided, and the individual operator—assuming that the patient is physically strong, by this route a stone of up to 10 ounces can be dealt with satisfactorily in an adult. Beyond that size and in broken down patients, I would infinitely prefer perineal lithotomy to any suprapubic operation. In this province there is now a considerable number of Weiss' No. 26 lithotrites for this purpose, viz., to insert through an ordinary sized lateral lithotomy wound to crush up the stone. I have used it myself a few times, and it is certainly a very effective weapon. The one point I wish to emphasize for those who have not had the opportunity of dealing with large stones is, that in either perineal or suprapubic lithotomy, there is very little room in the bladder to work owing to the escape of the fluids and the contraction of the bladder. There should be no difficulty in harnessing a No. 26 lithotrite once or twice on a large stone, but beyond this there is great difficulty. The fragments stand in the way of the points or angle of the instrument, and under these circumstances, it is better to remove the large instrument once the stone has got one or two good fractures, and to use a smaller one, or, better still, to use a crushing forceps to deal with the fragments.

It may be asked why not use an ordinary lithotomy forceps? Experience early taught me that it is an easy matter to get hold of a stone or a large fragment in forceps in the bladder, and that if you find that you have caught an objectionably large stone or fragment or have caught either in an undesirable position, it is exceedingly difficult to get it out of the forceps. You have generally got to fetch it with you. In the case of a fragment, its sharp corners project beyond the blades of the forceps, and they tear anything which comes in their way. Hence I am of opinion that the ordinary forceps should be relegated to the museum and that crushing forceps the blades of which are no larger than those of the ordinary forceps should be adopted in their stead. The crushing forceps of Mr. Reginald Harrison are too gigantic in the blades and are not well adapted for grasping. There is a forceps now made by Messrs. Weiss and Sons for this purpose with blades, the front of the joint is much the shape of a duck's beak and behind the joint is long and powerful. They will pass where the ordinary forceps pass. The margin of the blades is serrated for the purpose of clipping off the sharp fragment which may project. The instrument is powerful enough when pressed with both hands to squash up a large fragment and trim its edges or to squash up and reduce the size of an ordinary sized whole stone such as we meet in children. I have used the instrument and now use no other forceps in lithotomy or lithotripsy. I regard it as the compliment of the giant lithotrite in the lithotripsy of large stones.

JULLUNDUR.

HENRY SMITH, MAJOR, I. M. S.

WHARTON HOOD'S TREATMENT OF INJURIES

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In connection with Captain Sumner's interesting paper in the August number of the *Indian Medical Gazette* on the Treatment of Fractures by Strapping and Massage, I would like to draw your attention to the value of this method when employed in cases of ruptured muscle and simple sprains of joints. The following case that I had in February of this year will serve to illustrate the satisfactory results that may be obtained. A young lady was playing tennis when, in making an effort to take a service, she felt some thing snap in the calf of her right leg. She was quite unable to move, and had to be carried to her trap and taken home. I saw her the same evening when she complained of the most acute pain when she attempted to move the leg. On examining the limb, I could detect no distinct sulcus in the calf muscles, but from the history, I had no doubt that she had ruptured some fibres of the soleus or gastrocnemius. The pain was localised at a point just below the middle of the calf. I adopted Wharton Hood's method and strapped the leg with successive pieces of unstretchable adhesive plaster for a distance of eight inches—the centre of the strapping corresponding to the painful spot. The effect of the support thus given to the wounded tissues was at once evident, and that evening the patient was able to place her foot on the ground. The limb was massaged twice daily, and the patient

encouraged to use it as much as possible. In five days she was able to walk a hundred yards, and was so much better that she went for a drive. Unfortunately the horse, being fresh, bolted and threw the occupants out on to some grass by the side of the road. My patient fell upon her left foot and sprained her left ankle, no damage was done to her previous injured right leg. I saw her an hour after the accident when the left ankle-joint was much swollen and exceedingly painful. Having gently massaged the joint, I strapped it according to the method advised by Wharton Hood. The next day I kept the patient in bed, rubbed the joint through the plaster morning and evening, and encouraged her to flex and extend the foot as much as possible. On the third day she moved about the house and verandah pushing a chair in front of her for support. The leg that had been injured originally had become stiff from the rest, but this soon passed off, and I am sure that the increased work that it now had to do owing to the injury of the other leg, did it good. Twelve days after spraining her ankle, the patient was walking quite comfortably with a stick, and two days later was bicycling short distances, though she required help in starting.

I have had equally good results in cases of rider's strain and tennis elbow—the treatment consisting of strapping, massage, and movement. The best results are obtained when the case is seen directly after the accident, but much good may be effected from an adoption of the above methods in chronic cases.

Any one who is interested in the subject should read Wharton Hood's book on "*The Treatment of Injuries by Friction and Movement*" (Macmillan & Co.), in which the author explains most clearly the methods and principles of his treatment.

The frequency of these so called minor injuries and the unsatisfactory results often obtained when treated on the old plan by rest, lotio evaporans and tinctura iodi must be my excuse for writing at such length.

Yours, &c,

P G EASTON, LIEUT, I M S,
Officiating Civil Surgeon.

KARNAL, PUNJAB, }
15th August 1905 }

REPORT OF A GENUINE CASE OF VIPER BITE IN A DOG TREATED WITH PERMANGANATE OF POTASH RECOVERY

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Two officers of this station had gone out shooting one afternoon with three dogs. One dog which was walking ahead was bitten on the upper part of his foreleg by a very big Russell's Viper (*Daboia Russellii*). The officers saw the snake biting the dog which had some difficulty in getting himself released. The other two dogs when they saw what had happened, ran and caught hold of the snake, there was a regular struggle in which these two dogs were also bitten, one on the forehead, the other on the chest. No ligature could be applied in these last two, so they were left alone, but the officers applied a very tight ligature on the leg of the one first bitten, and within an hour and a half they brought him to me. The dog being a valuable one they wanted me to try anti-venene, but I knew it was no good for viper bite. I had Lauder Brunton's lancet in my pocket and determined to try the permanganate treatment.

On examination I found that there were two very tight ligatures on the leg which was swollen owing to the stoppage of circulation. Both of them were tied above the punctures. On the upper part of the leg below the ligatures, there were two punctures about one inch apart and about the same in depth. There were two more suspicious punctures on the lower part of the same leg and it was thought that the dog might have been bitten twice on the same leg. I cut open these and found in one a thorn. These two latter punctures had a longer distance between them than the two former had and could not have been fang marks. I cut open the first two along with these and rubbed in permanganate of potash for about fifteen minutes, and then slowly and gradually opened the ligatures and went on rubbing the crystals and shampooing the leg till a good deal of the swelling had disappeared. I gave directions to have the dog wrapped in a blanket and given some tea. Next morning the owner told me that the dog had become a little drowsy and remained so up to about eleven o'clock in the night, i.e., until four hours after the treatment, and then the drowsiness passed away. The two other dogs died within two and a half hours of being bitten.

When I found that the dog had recovered, I asked the owner to send for the snake, as I wished to see it to make sure that it was a Russell's Viper. He very kindly got the snake which was about four feet long and as thick as my wrist. It had four fangs on each side, two well developed and two rudimentary.

This was a genuine case of recovery under the permanganate treatment from the bite of a full grown Russell's Viper. The interesting points were—

- (1) That the snake was killed and identified
- (2) That the two officers saw the snake biting the dog and hanging on to it, there was no doubt therefore that the bite was effective
- (3) That the dog was bitten the first of the three and therefore presumably got a very full dose of poison
- (4) That a ligature applied immediately was effective for one and a half hours in preventing the absorption of a fatal quantity of the poison
- (5) That the other two dogs which were not treated succumbed within two and a half hours. These two dogs were not brought to me for the treatment, but were sent direct to the owner's house, where he found them dead on return after the treatment of the first dog.

BHANDARA, C P, }
August 1905 }

L N CHOUDHURI, L.M. & S.,
Offg Civil Surgeon

RADICAL CURE OF HYDROCELE

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In the *Indian Medical Gazette* for the current month you have reproduced from the *British Medical Journal* a letter from Dr Tandon, of Luoknow, regarding the so-called "Pratt's Operation" for the radical cure of hydrocele. It might interest Dr Tandon to know that the operation by eversion of the sac was first performed by Doyen, of Reims, France, in 1895, and that he was followed by Dinkoiman in 1898.

Yours truly,
HYDROCELE

(Doubtless this operation had been done before by other Surgeons, but it was the publication in this *Gazette* of Col Pratt's paper which made the method widely known in India.—Ed, I M G.)

COUCHING FOR CATARACT

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In reply to Major Smith's letter of enquiry in your June number, I may say that I consider 'cataract-couching' would be justifiable under the conditions given in cases 3 (first half), 5, 7 and 10 of Mr Henry Power's classification, which was reproduced with my paper in your May issue.

In cases of dacryo cystitis for which Major Pridmore considers couching to be allowable if not advisable, I have for many years extirpated the lachrymal sac before extraction very much in the way described by Major Elliot in your August number.

Yours, &c.,
F P MAYNARD,
Major, I M S

CALCUTTA, }
August 1905 }

SPONTANEOUS EXPULSION OF A VESICAL CALCULUS

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Defective metabolism shows itself in various ways. One of these is the formation of uric acid of the various phenomena which this acid gives rise to the deposit of 'sand' in the internal organs, is quite common. In the kidneys when such a deposit is fine, no acute symptom in the shape of pain or colic results. But when minute granules coalesce and small stones form, then the characteristic symptoms of renal colic develop, which, generally subside when the tiny stone is passed through ureter into the bladder. Here it does not always remain and develop into a big stone. Very often it is passed per urethram. But when on account of various causes a stone is formed, then the trio of symptoms indicating its presence develop, viz., pain, hæmaturia, and retention, the calculus is either crushed or removed by cutting. Spontaneous cure of such stones is not heard of. But the case I describe below is interesting, as it shows the spontaneous expulsion of a three-ounce calculus from the bladder outside the body. The condition is rare, and this is my apology for making it public.

H D, a young Mahomedan of about the age of 18, was cut for stone while he was a child of four years. The operation was one of lateral lithotomy performed in the usual way. The wound healed, and the patient was discharged cured. For twelve years afterwards he remained totally free from symptoms. Since last two years he began to suffer again from pain, &c., which were relieved by taking milk and ghi, but the relief was only temporary. For the last three months the symptoms became more and more acute. He gradually began to feel pain over the site of his lithotomy wound scar, the part around became swollen, hot and red, and one night after

profuse bleeding he passed a stone through the perineum. This wound healed in the usual way, and the patient did not develop any complication. The case is very interesting. In the first place, it is very rare for big stones to cut their way out of the bladder. Secondly it shows the recurrence after lithotomy, after a comparatively long time (twelve years). Thirdly, considering the size of the stone and the local inflammation it gave rise to, it is noteworthy that no after effects or complication arose.

The stone consisted of urates of lime, with an incrustation of phosphates. Its weight was 3 oz. and its shape oval.

Yours, &c.,

MIR HIDAYATULLAH, L M & S.,

Asst Surgeon, Jhelum, Punjab

HYDRATE OF CHLORAL POISONING

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—A middle class native, male, aged about 35 years, was admitted to the Police Case Hospital, Alipore, on the 7th May 1905, suffering from symptoms of chloral poisoning.

He has suffered for years from epilepsy, and had been advised for his inability to sleep to take an occasional dose of hydrate of chloral. On the night of the 6th May (he had previously purchased a 4-oz. phial of chloral), feeling done and uneasy, he wrote a letter to say that he intended making away with himself. He poured a quantity of chloral into a glass containing lemon syrup and drank it off. About an hour afterwards from the way he was breathing, his wife became alarmed and called for assistance. He was sent to hospital at 3 A.M. On arrival he was unconscious with stertorous breathing, eyes congested, pupils contracted minutely, pulse thin and very rapid, face suffused with a faint odour of chloroform from the breath.

The usual treatment was resorted to the stomach was well washed out with Condy's, hypodermic injection of strychnine and ether, cold douching and galvanic battery, &c.

He remained unconscious until the morning of the 8th, or 28 hours after admission into hospital. He was discharged cured on the morning of the 9th, but in a very weak condition.

It was computed from the remains in the phial and the patient's own statement after his recovery that he took no less than 595 grains of the drug.

ALIPORE,
18th August 1905 }

F J DALEY,
Medical Officer, Central Jail

PROSTATIC ENLARGEMENT

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—There is a good deal written nowadays in the home papers on the above subject. In one article I saw it stated that this condition is not common in India.

My experience of Indian surgery is not very extensive, but such as it is, it has led me to conclude that this statement is not altogether correct, at least not for the Punjab.

Retention cases are extremely common, as many as eight or ten having been under treatment at one time. I have examined a large number of these and so far as my memory goes, almost all have had some degree of enlargement of the prostate. Some cases being distinctly hard, others large and soft, in some the passage of a catheter has drawn blood.

The routine treatment has been with strychnine and mag sulphate, the results being fairly satisfactory. My object in writing this letter is to ask those who have had experience in operating on such cases to kindly state whether operation is satisfactory—some maintain it is not.

As to choice of operation with results, any information on this head would be greatly valued.

SCOTCH MISSION,
Jalalpur Jattan. }

Yours, &c.,
H MARTYN NEWTON

(Discussion is invited.—Ed., I M G.)

Service Notes.

The following important changes are announced —

492 MEDICAL DEPARTMENT—(MILITARY ORGANISATION)
—The Governor General in Council has approved the following redistribution of administrative changes of Principal

Medical Officers, under the rank of Surgeon General, consequent on the redistribution of the army —

Commands	Divisions and Brigades	REMARKS
Northern Command	1st (Peshawar) Division	The Divisional Principal Medical Officer to administer the Nowshera and Mardan Brigades direct.
	2nd (Rawal Pindi) Division Abbottabad and Sialkot Brigades	
	3rd (Lahore) Division Sirhind and Jullundur Brigades	The Divisional Principal Medical Officer to administer the Multan and Ferozepore Brigades direct.
	Kohat Brigade Derajat and Bannu Brigades	
Western Command	4th (Quetta) Division Karachi Brigade	Includes civil medical administration of Sind.
	5th (Mhow) Division Jubbulpore and Jhansi Brigades	The Divisional Principal Medical Officer to administer the Nasirabad Brigade direct.
	6th (Poona) Division Bombay Brigade Aden Brigade	The Divisional Principal Medical Officer to administer the Ahmednagar and Belgaum Brigades direct.
Eastern Command	7th (Meerut) Division Bareilly and Garhwal Brigades	
	8th (Lucknow) Division Presidency and Assam Brigades	The Divisional Principal Medical Officer to administer the Allahabad and Fyzabad Brigades direct. The Civil and Sanitary Commissioner's duties hitherto performed by the Principal Medical Officer, Assam, to be now arranged for by the Civil Authorities.
	9th (Secunderabad) Division	The Divisional Principal Medical Officer to administer the Secunderabad and Madras Brigades direct.

Commands	Divisions and Brigades	REMARKS
	Bangalore and Southern Brigades	
Burma Division	Burma Division	The Divisional Principal Medical Officer to administer the Rangoon and Mandalay Brigades direct.

NOTE—(1) With the exception of the administrative charge of the Derajat and Bannu Brigades which is reserved for a Lieutenant-Colonel of the Indian Medical Service, all the above are Colonel's appointments to be divided equally between the Royal Army Medical Corps and Indian Medical Service, but no particular appointment will be reserved for either service.

(2) The revised arrangement will not affect the rule laid down in the footnote to paragraph 37, Army Regulations India, Volume VI (1904 edition). The Principal Medical Officers concerned will continue to be, as heretofore, visitors to Innatic asylums in their respective administrative areas.

493 MEDICAL DEPARTMENT—ORGANISATION—The Commander-in-Chief in India is pleased to notify that the redistribution of administrative medical appointments, published in India Army Order No. 492, dated 11th August 1905, will take effect from 1st October 1905, and in connection therewith to make the following appointments—

Commands	Divisions and Brigades	Principal Medical Officers
Northern Command	1st (Peshawar) Division	Colonel W L Chester, R.A.M.C.
	2nd (Rawal Pindi) Division	Colonel B M Blennerhassett, C.M.G., R.A.M.C.
	Abbottabad and Sialkote Brigades.	Col H R. Whitehead, R.A.M.C.
	3rd (Lahore) Division	Colonel H J W Barrow, R.A.M.C.
	Sirhind and Jullundur Brigades	Colonel H Hamilton, C.B., I.M.S.
	Kohat Brigade	
Western Command	Derajat and Bannu Brigades	Lieutenant-Colonel G J Kellie, I.M.S.
	4th (Quetta) Division	Colonel J McCloghry, I.M.S.
	Karachi Brigade	Colonel H B Briggs, I.M.S.
	5th (Mhow) Division	Colonel W S Pratt, V.H.S., R.A.M.C.
	Jubbulpore and Jhansi Brigades	Colonel J F Williamson, C.B., C.M.G., R.A.M.C.
	6th (Poona) Division	Colonel F W Trever, R.A.M.C.
	Bombay Brigade	If an incumbent is not appointed by the time these changes take place, the senior medical officer on the spot to take charge under Article 192, Army Regulations, India Volume I, Part I.

Commands	Divisions and Brigades	Principal Medical Officers
Eastern Command	Aden Brigade	Colonel J S Wilkins, D.S.O., I.M.S.
		Lieutenant-Colonel (temporary Colonel) W G H Henderson, V.H.S., I.M.S., to officiate, <i>vice</i> Colonel Wilkins on leave.
	7th (Meerut) Division	Colonel W E Saunders, V.H.S., R.A.M.C.
	Bareilly and Garhwal Brigades	Colonel C H Beatson, I.M.S.
Secunderabad Division	8th (Lucknow) Division	Colonel G D N Leake, R.A.M.C.
		Lieutenant Colonel (temporary Colonel) D Wardrop, R.A.M.C., to officiate, <i>vice</i> Colonel Leake, on leave.
	Presidency and Assam Brigades	Colonel H K McKay, C.B., I.M.S.
Burma Division	9th (Secunderabad) Division	Colonel A F Dobson, I.M.S.
	Bangalore and Southern Brigades	Colonel P H Benson, I.M.S.
	Burma Division	Colonel T J H Wilkins, I.M.S.

2 The Principal Medical Officer, His Majesty's Forces in India, will issue such instructions regarding transfers of office establishments, and disposal of furniture and records as may be necessary in connection with the redistribution of administrative medical charges.

LIEUTENANT B B PAYMASTER, I.M.S., to the officiating medical charge of 43rd Erinpra Regiment, *vice* Captain E C G Maddock, I.M.S., granted leave.

LIEUTENANT W S J SHAW, I.M.S., to the officiating medical charge of 123rd Outram's Rifles, *vice* Captain W M Houston, I.M.S., on leave. This cancels the order No. 701 of 1903, referring to Lieutenant J L Lunham, I.M.S.

INDIAN SUBORDINATE MEDICAL DEPARTMENT—I—2nd Class Assistant-Surgeon A L DeCunha, Commanding No. 24 Company, Army Bearer Corps, Bombay, to command No. 29 Company, Army Bearer Corps, Karachi, *vice* 2nd Class Assistant-Surgeon J M Nunes, vacating appointment on attaining forty two years of age, on 5th September 1905.

II—3rd Class Assistant-Surgeon E E Thipthorp, to command No. 24 Company, Army Bearer Corps, Bombay, *vice* 2nd Class Assistant-Surgeon A L DeCunha, transferred to Karachi, with effect from the date he takes over charge.

WE note that for 40 vacancies in the R.A.M.C. in the July examination there were only 60 candidates.

COLONEL S H BROWNE, M.D., C.B., I.M.S., Inspector General of Civil Hospitals, Bengal, went on eight months' leave on 30th August. By the end of this period Colonel Browne will have put in three years as Inspector General, and will be entitled to the half extra pension. It is not probable that he will return to India. Colonel Browne, after having served for a short period in the Royal Navy, entered the I.M.S. on 31st March 1874, he served in the Afghan Campaign, and entered civil employ in the Central Provinces, he was afterwards Civil Surgeon of Simla, and for many years Principal of the Lahore Medical College. The other Bengal men in

his batch were E Muir, recently Inspector-General of Jails in Bengal, now retired, James Armstrong, J C Fullerton, recently retired from Quetta, the late O H Warden, the well known chemist. The Madras men of the March 1874 batch are Colonel P H Benson, Lieutenant-Colonel J Lancaster, Colonel W G King, C I E, now gone to Burma as Inspector General of Civil Hospitals, in Bombay of that batch there are Colonel J S Wilkins, D S O, and Lieutenant-Colonel W A Barren (retired).

Colonel Browne has been able to do a great deal for Civil Hospitals and Dispensaries in Bengal, and his departure will be generally regretted by Civil Surgeons.

MAJOR J GARVIE, I M S, has been granted six weeks' privilege leave.

LIEUTENANT COLONEL R R WEIR, I M S, has been granted six weeks' privilege leave.

CAPTAIN CAMPBELL DYKES, I M S, acts as Superintendent of the Fatehgarh Central Jail *vice* Lieutenant Colonel R R Wen, in addition to his other duties.

MAJOR J R ADIE, I M S, was granted one month's leave and Captain J G S Swan, I M S, acted for him.

LIEUTENANT H ROSS, I M S, on the return from leave of Lieutenant Colonel Little, I M S, remains on plague duty in Rawal Pindi District.

SIR BENJAMIN FRANKLIN, K C S I, I M S (retired), has been appointed a "Knight of Grace of the Order of St John of Jerusalem in England."

CAPTAIN ATAL, I M S, and Lieutenant Bradfield, I M S, were recently employed on cholera duty during the severe outbreak in Madras.

THE services of Captain M N Chaudari, I M S, are placed at the disposal of the Madras Government permanently, with effect from 12th April.

CAPTAIN L J M DEAS, I M S has joined the Foreign Department and is posted as Civil Surgeon of Peshawar.

NO 734—The undermentioned officers who were appointed Lieutenants on probation for the Indian Medical Service having completed a course of instruction at the Medical Staff College, and being reported qualified, have been admitted to the service, their commissions being dated 1st February 1905—

Arthur Francis Hamilton (Western Command)
Arthur Denham White (Eastern Command)
Michael Foster Reaney (Eastern Command)
Ralph Koper White (Northern Command)
Hugh Clive Buckley (Eastern Command)
Norman Methven Wilson (Northern Command)
John Stevenson O'Neill (Northern Command)
Mathew Robert Cecil MacWatters (Northern Command)
William Herbert Boalch (Western Command)
George Alick Soltan (Northern Command)
William Haywood Hamilton (Northern Command)
John Cunningham (Western Command)
Herman Falk (Western Command)
Charles Joseph Coppinger (Western Command)

SANITARY INSPECTIONS—MESSRS.—With reference to paragraph 68, Army Regulations, India, Volume VI, medical officers when carrying out their sanitary duties will include officers' messes in their inspections, paying particular attention to the kitchens and surroundings.

LIEUTENANT COLONEL A. SILCOCK, I M S, Civil Surgeon of Raipur held in addition charge of the Central Jail, Raipur, with effect from 13th May 1905.

THE retirement of Colonel J T B Bookey, C B, I M S, is dated from 10th June 1905.

ON Captain D McCay, being appointed Professor of Physiology in the Medical College, Calcutta, Lieutenant G D Franklin, M B, I M S, is appointed to the vacancy in the medical charge of the 8th Gurkha Rifles.

CAPTAIN A. W. OVERBROOK WRIGHT, I M S, is appointed to the medical charge of 17th Infantry, *vice* Captain T B Kelly, I M S, transferred to a cavalry regiment.

CAPTAIN IAN LAMONT MACINNES, M B, I M S, has been permitted to resign his commission from 28th July 1905.

LIEUTENANT COLONEL COBB, I M S, has been permitted to return to duty.

ON return from leave Lieutenant-Colonel A O Evans, I M S, becomes Civil Surgeon of Amhorst District, and Major W G Pridmore, I M S, goes to Mandalay as Civil Surgeon, *vice* Major A R P Russell, I M S, going on leave.

LIEUTENANT COLONEL W BOYD, I M S, of St. George's Hospital, Bombay, has gone on leave, pending retirement after many years' service in Bombay.

LIEUTENANT W FORRESTER, I S M D, acted as Superintendent of the Central Jail at Mooltan during the absence on privilege leave of Captain E L Ward, I M S.

CAPTAIN R J BRADLEY, I M S, made over charge of the Jail at Jullunder to Assistant-Surgeon Atar Chand on 1st August 1905.

COLONEL C H JOUBERT's retirement is dated from 29th March 1905.

MAJOR R L HAGGER, I M S, is appointed to the medical charge of 35th Sinde Horse, *vice* Captain F H G Hutchinson, I M S, in civil employ.

LIEUTENANT J L LONHAM, I M S, is appointed to the officiating medical charge of 36th Jacob's Horse, *vice* Major E G R Whiteome, I M S, granted leave.

LIEUTENANT T F OWENS, I M S, is appointed to the officiating medical charge of 127th Baluchis, *vice* Captain G E Stewart, I M S, granted leave.

CAPTAIN C G WEBSTER, M B, I M S, has been elected a Fellow of the Royal College of Surgeons, Edinburgh.

It has been decided that, during the forthcoming tour in India of the Prince and Princess of Wales, the custom with regard to dress on all official occasions, and at all entertainments when their Royal Highnesses are present, should be the same as on similar occasions when the Viceroy is present.

THE following gentlemen were successful at the examination for admission to the Indian Medical Service held on July 25th and the four following days—

Marks		Marks.	
Palmer, C E, M B	3,407	Wright, W D, M B	3,164
Reinhold, O H	3,395	Whitmore, V N	3,158
Hayden, A F, M B	3,348	Boyd, J F	3,150
Newland, B E, M	3,303	Sodhi, N S	3,081
McDonald, E J C	3,275	Catto, J, M B	3,054
Lack, L A, H, M B	3,278	Gray, W C, M B	3,041
MacKenzie, K W, M B	3,187	Powell, W J, M B	3,034

Forty two candidates (twenty seven of whom had University degrees) competed for the fourteen vacancies.

WE quote the following from the proceedings of a meeting of the Royal College of Physicians, London—

"The Registrar proposed the enactment, for the second time of the following Bye law. That Leonard Rogers, M D (Lond) elected a Fellow on April 27th last, being resident in Calcutta, be admitted *in absentia*, any Bye law to the contrary notwithstanding. This was agreed to, and Dr Rogers was admitted a Fellow."

We have already announced that Major Leonard Rogers has been made a F.R.C.P. Fellows of this College are rare in India, we can only remember at present Lieutenant-Colonel G F A. Harris, F.R.C.P. Are there any other I.M.S. men Fellows of this College?

DR W D JONES, Civil Surgeon, Kyaukse, was granted one month and sixteen days' extension of leave.

THE services of Captain L J M Deas, I M S, are placed at the disposal of the Foreign Department from 23rd May 1905.

ON the retirement of Lieut Col J Crofts, Lieut. Col G W P Denny, I M S, becomes an Agency Surgeon, 1st class.

COLONEL H HAMILTON, M D, C B, is appointed Hon Surgeon to the Viceroy, *vice* Colonel J T B Bookoy, C B, I M S, retired

CAPTAIN E L WARD, I M S, has got 3 months' privilege leave, and Lieutenant W Forrester, I S M D, acts for him as Superintendent of the Central Jail at Multan

LIEUTENANT P G EASTON, I M S, was appointed to act as Civil Surgeon of Karnal from 15th July

LIEUTENANT COLONEL J W RODGERS, I M S, took over charge of the civil medical duties of Kohat on 14th July, relieving Lieutenant H C Keates, I M S.

CAPTAIN T B KELLY, F R C S E, I M S, is appointed to the medical charge of 1st D Y O Lancers, *vice* Major G T Mould, I M S, retired

LIEUTENANT C S PARKER, I M S, is appointed to the medical charge *suo tem* of 4th Cavalry

LIEUTENANT J L LUNHAM, I M S, is appointed to the officiating medical charge of 123rd Outram Rifles, *vice* Captain Houston, I M S, granted leave

LIEUTENANT E W C BRADFIELD, I M S, has been on cholera duty in Madras

CAPTAIN R. G TURNER, I M S, has been posted as Civil Surgeon of Etawah, U P

MAJOR C G SPENCER, F R C S (Eng), has been appointed Professor of Surgery in the R A M College, *vice* Surgeon General W F Stevenson, C B, retired

ON Saturday, 1st July, the new Military Hospital at Mill bank London, was formally opened by H M The King

COLONEL C H BRATSON's promotion is dated from 16th June 1905, and that of Colonel H B Briggs, M B, from 10th July 1905

FROM 28th July the following I M S officers are promoted Captains—F A Barnardo, J McPherson, G D Franklin, C A Gourlay, I M S, W E Ross, R A Lloyd, J O G Kunhardt, E A Walker, L Cook, L B Scott, G I Davys, H Halliday, G C I Robertson, A J V Betts, F E Wilson, W S Patton, W L Trafford, B B Paymaster, N W Mackworth, H Ross, J Forrester, B Crossle, L Hirsch, L Randall, E C C Maunsell, H E J Batty, J W Illius, D S A. O'Keefe, J P Cameron

COLONEL J McCLOUGHRY, F R C S L, I M S, Principal Medical Officer, Karachi Brigade, is transferred on the public service as Principal Medical Officer, 4th (Quetta) Division, *vice* Colonel T S Weir, I M S, who completed tenure of appointment on 9th July 1905

LIEUTENANT COLONEL H B BRIGGS, M B, Indian Medical Service, to be Principal Medical Officer, Karachi Brigade, *vice* Colonel J McCloaghry, F R C S I, Indian Medical Service, transferred as Principal Medical Officer, 4th (Quetta) Division

LIEUTENANT COLONEL W G HENDERSON, F R C S I, V H S, I M S, to officiate as Principal Medical Officer, Aden Brigade, *vice* Colonel J S Wilkins, D S O, I M S, granted leave out of India.

LIEUTENANT COLONEL S LITTLE, M D, I M S, made over charge of civil medical duties of Rawal Pindi to Lieut H Ross, I M S, on 14th June 1905

CAPTAIN H W ILLIUS, I M S, is appointed to the medical charge of the 58th Rifles

CAPTAIN J HUSBAND, I M S, is appointed to the medical charge of the 59th Rifles

THE Government of India have decided* that the periods spent by military officers with the China, the South African and the Somaliland Field Forces will be reckoned as active service counting towards their Indian furlough and pension

CAPTAIN D H F COWIN, I M S, was granted privilege leave for two months

CAPTAIN W H CAZALY, I M S, was granted three months' extension of leave on medical certificate

FIRST CLASS ASSISTANT SURGEON C RAYMOND, I S M D, from the sub medical charge of Section Hospital, Mhow, to the sub medical charge of Station Hospital, Hyderabad

SECOND CLASS ASSISTANT SURGEON C R POLLOCK, I S M D, from the Station Hospital, Poona, to the sub medical charge of Section Hospital, Mhow

SECOND CLASS ASSISTANT SURGEON W J S MAINE, I S M D, to the sub medical charge of Section Hospital, Ahmednagar

Command Order No 665 of 1905 so far as it refers to 2nd Class Assistant-Surgeon G A Deane, I S M D, is cancelled

WE are pleased to be able to announce that the University of London has conferred the degree of M D, on Major R. H Elliot, F R C S, I M S, the Professor of Ophthalmology at Madras. It is an exceptional honour to have this degree conferred without examination but according to the regulations "if a thesis or published work is of sufficient excellence, the candidate may be exempted from the written as well as the practical part of the examination"

The excellence of Major Elliot's work on snake venom is well known to our readers. It will be remembered that last year Major Elliot received from the University of Edinburgh the degree of S C D for his snake venom work. We do not know if Major Elliot has ever been thanked by the Government of India for this special work

SURGEON GENERAL BOMFORD, M D, I M S, has been made an Honorary Fellow of the Royal College of Surgeons of Edinburgh

LIEUTENANT COLONEL J W RODGERS, I M S, made over charge of the duties of Superintendent, Kohat Jail to Lieutenant H C Keates, I M S, on the forenoon of the 10th July 1905

LIEUTENANT T C MCCOMBIE YOUNG, I M S, made over charge of the duties of Superintendent, Bannu Jail, to Captain J Husband, I M S, on the afternoon of the 11th July 1905

CAPTAIN J HUSBAND, I M S, assumed charge of the civil medical duties of the Bannu District on the afternoon of the 11th of July 1905, relieving Lieutenant T C McCombie Young, I M S

CAPTAIN J GOOD, I M S, Captain M Dick, I M S, M F O Castei, I S M D, Hospital Assistants Shah Mahomed Ahmad, Gang Ram, Hussain Buksh, and Brijlall have passed the Lower Standard Examination in Burmese. Captain Dick is noted as having passed "with credit."

LIEUTENANT COLONEL A O EVANS, I M S, in return from leave, resumes charge of the Amherst District, Burma

MAJOR W G PRIDMORE, I M S, officiates as Junior Civil Surgeon, Rangoon, *vice* Major J Penny, I M S, transferred

CAPTAIN N R J RAINIER, I M S, was granted 23 days' privilege leave

MAJOR W C VICKERS, I M S, has got one year's leave (m c) up to 30th June 1906

* Military Department letter No 1693 A, dated 17th July 1905

MAJOR C F FERNSIDE, I M S, got six weeks leave from 19th August 1905

We regret to learn that Major Fernside has again to visit the Kasauli Laboratory, having a second time been bitten by a rabid dog

CAPTAIN T H SYMONS, I M S., has got 16 months' leave up to 12th November 1906

CAPTAIN A MILLER, I M S, has got combined leave for 18 months up to 10th December 1906

CAPTAIN D C KEMP was due back from privilege leave on 18th September 1905

CAPTAIN W H TUOKER was granted six months' combined leave (m. c) till 18th January 1906

CAPTAIN T W D GILLESPIE, I S M D, is appointed to be Superintendent of Panchgani (Bombay) for a period of three years, *vice* Captain Easden

THE *Army and Navy Gazette* of July 22nd contains the following announcement "Some changes in the *personnel* of the Royal Army Medical College may shortly be expected. We understand that the Professor of Clinical and Military Medicine, Colonel K MacLeod, I M S, retired, will vacate the appointment and be succeeded by Colonel David Bruce, C.B., F.R.S., R.A.M.C. Then the Professor of Military Surgery, Surgeon General W F Stevenson, O.B., R.A.M.C., retires at the end of this month, and will, in all probability, be succeeded by Major C G Spencer, R.A.M.C., whose claims and qualifications stand very high, he being an M.B. (Lond.) and F.R.C.S. (Eng.) Further, in January next, Lieutenant-Colonel R H Firth, R.A.M.C., Professor of Military Hygiene, will vacate his appointment. The selection of his successor lies between Lieutenant-Colonel A. M. Davies, R.A.M.C., now expert in sanitation, and member of the Army Medical Service Advisory Board, and Major W H Horrocks, R.A.M.C. Both possess high qualifications. It is reported that close on 80 officers of the Royal Army Medical Corps will be required for India and the Colonies during the next relief season. Last season about a similar number were also on the foreign roster."

The appointment of Colonel D Bruce, R.A.M.C., F.R.S. (though a good one in itself) means the loss of one appointment for retired I M S officers, an appointment held by Maclean, Boyes-Smith and MacLeod

CAPTAIN J B CHRISTIAN, I M S, is appointed to the medical charge of 104th Wellesley's Rifles, *vice* Captain H Bennett, I M S, transferred to civil employ

CAPTAIN R. M. CARTER is appointed to the medical charge of 116th Mahrattas, *vice* Captain A W F King, I M S, transferred to the Civil Department.

CAPTAIN L P STEPHEN, I M S, 110th Mahrattas, has been granted one year's furlough

CAPTAIN C M GOODBODY, I M S, Agency Surgeon in Haraothi and Tonk, is granted two months and 25 days' privilege leave, and Lieutenant H Crossle, I M S., acts for him

LIEUTENANT COLONEL W COATES, I M S, Civil Surgeon of Lahore, has obtained one month and 28 days' privilege leave from 14th August.

LIEUTENANT-COLONEL H HENDLEY, I M S., acts as Civil Surgeon of Lahore and Professor of Midwifery and Forensic Medicine, *vice* Lieutenant Colonel Coates, on leave

CAPTAIN H SMITH, I M S, Civil Surgeon of Jullunder, got one month's leave from 31st July 1905

CAPTAIN R J BRADLEY, I M S, acted as Civil Surgeon of Jullunder, *vice* Major Henry Smith, I M S, on privilege leave

LIEUTENANT W W JUDWINE, I M S, acted as Civil Surgeon of Jhelum from 4th July, *vice* Major Ogilvie, I M S

THE attention of I M S officers is directed to the following notice —

"*Indian Military Service Family Pension Fund* — Two cases have recently been brought to the notice of the Commander in Chief of the families of officers being left either totally or partially unprovided for owing to the non observance of the rules governing the Indian Military Service Family Pension Fund

In one case the officer neglected to report his marriage, and in the other, although the marriage was reported, but no report was made of the birth of two children, with the consequent result that the widows and children are now the sufferers

All officers of the Indian Army are enjoined to make themselves acquainted with the rules on a matter of such vital importance to their families, and to realise that the responsibility of reporting domestic occurrences as early as possible to Pay Examiners concerned, rests solely with themselves, and not, as they may imagine, with the regimental or departmental authorities. The disregard of these rules, the penal clauses* of which are quite clear and precise, may have very serious consequences as in the regrettable instances under notice"

MAJOR J S S LUMSDEN, I M S, was granted an extension of furlough by three days

CAPTAIN W S WILLMORE, I M S, Civil Surgeon, Bulandshahr, U P, was granted one month's privilege leave from 4th September 1905

LIEUTENANT COLONEL H J DYSON, I M S, goes to Hazaribagh as Civil Surgeon, and Captain E A R Newman, I M S, goes to Bhagalpur

CAPTAIN KING, I M S, who was officiating as Civil Surgeon of Bhagalpur, has had to take sick leave from the middle of August

CAPTAIN ANDERSON McKENDRICK, I M S., recently Civil Surgeon of Nadia, has gone to Kasauli to take charge of the Pasteur Institute

MAJOR R. J. MARES, I M S, was granted 15 days' leave from 1st September 1905

CAPTAIN A HOOTON, I M S, was appointed Civil Surgeon of Broach with effect from 7th March 1904

CAPTAIN H D F KNAPTON, I M S, was appointed Deputy Sanitary Commissioner, Sindh, with effect from 7th March 1904

MAJOR J B JAMESON, I M S, was appointed Civil Surgeon, Panch Mahals, from 24th May 1904, and of Surat from 25th April 1905, but to continue to hold the appointment of Superintendent of Mahabaleshwar

CAPTAIN V B BENNETT, I M S, was appointed Civil Surgeon of Panch Mahals from 25th April 1905

CAPTAIN NOVIS is appointed Civil Surgeon of Nasik

CAPTAIN A HOOTON, I M S, was appointed to act as Civil Surgeon of Ahmednagar

It is understood that Colonel D Wilkie, I M S, will become I G of Civil Hospitals in the new Province.

CIVIL SURGEONS now in the transferred districts will generally go over to the new Province E B and A

MAJOR B OLDHAM, I M S, succeeds Lieutenant-Colonel Whitwell, I M S, at Patna, and Major Cecil Stevens, M.D., F.R.C.S., goes to Cuttack, *vice* Major Oldham

CAPTAIN VICTOR LINDESAY, I M S, is appointed Civil Surgeon of Motihari

* Articles 1581 and 1583, Army Regulations, India, Volume I, Part I

THERAPEUTIC NOTES AND NOTICES

AN OPHTHALMOSCOPE

By N BISHOP HARMAN, M.B.

RECENTLY I shewed before the Ophthalmological Society a new ophthalmoscope made for me by Messrs Weiss & Son of London. The instruments at present in use are so good that it would be an impertinence to suggest that they were capable of modification. That which I have designed is something quite different from any existing machine, so it has at least the merit of novelty.

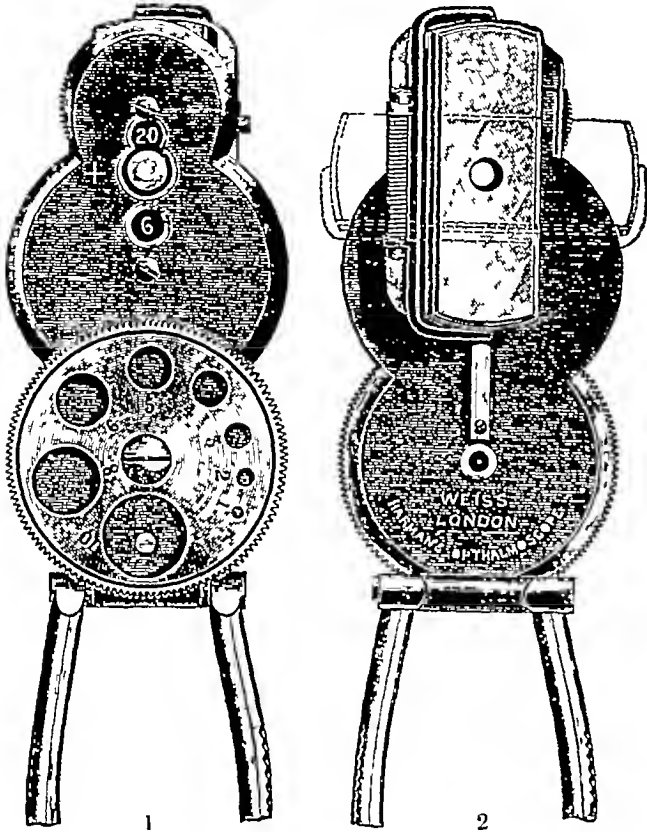


Figure 1 shows the obverse of the instrument. There is a sight hole with indicators above and below it, that above the sight-hole registers tens of dioptres, that below units. When the driving wheel is turned in either direction all the whole numbers of 70 consecutive dioptres pass beneath the sight-hole. The range for concave lenses is from 39 to 1 dioptres, for convex lenses from 30 to 1 dioptres, there is of course a blank in proper place in the series. Despite this great range of dioptres there are only 15 actual glass lenses in the instrument.

Figure 2 shows how this contrivance is brought about. There are two discs or wheels carrying lenses which overlap at the sight hole. The larger or units wheel is geared into the driving wheel and has ten holes, one is blank, and nine are glazed from -1D to -9D. At one point of the rim of this units wheel there is a finger like projection.

The smaller of tens wheel has seven holes, one is blank, the others are glazed with +10, +20, +30, -30, -20, -10 dioptres, the blank lies between the two 10D lenses, and the two 30D lenses are beside each other.

This tens wheel has fixed to one face a spur wheel of seven teeth, it is quite free from contact with the units wheel except when the revolution of the units wheel brings the finger like projection on its rim upwards in line with the axis of the instrument, then this finger engages a tooth on the tens wheel and pushes that wheel round one point a seventh of its circuit. The tens wheel is governed by a cam so that it only moves one point at a time and always stops accurately centred.

The finger on the units wheel is between 9D and 0, so when this wheel is revolved as 9D disappears from the indicator and before 0 appears the next tens lens in the series is automatically brought into position. The movement is repeated as the driving wheel is turned in either direction *ad infinitum*.

It will be noticed that all the unit lenses are concave whilst the tens lenses are both concave and convex, it follows that the dioptric value at the sight-hole at any point is the algebraic sum of the two figures appearing in the indicators above and below the sight-hole. The denominating numbers are engraved on the metal which carries to the lenses and

cannot be displaced, as is usual in England convex lenses are marked with red indicators and concave with white. This mechanism I have utilised is known as the "Jumping indicator" and was invented by Harding, an engineer of Leeds, about 30 years ago, it is almost human in its working, and has been successfully applied to numerous speed indicators for ships, cycles and carriages, turn stiles, meters and chronographs. There is no doubt about its stability and reliability, whilst the movement is so "sweet" (to use the engineers term) that it is hardly possible to tell by the touch when the tens wheel is being moved.

For rapidly setting the lenses at any desired point of the 70D range there is provision for driving the tens wheel directly by a touch of the finger. The mirror arrangement is new, it is a combination of the rotary mirror, the reversible double mirror and of Loring's tilting mirror.

There are a plane and concave mirrors placed back to back, so arranged that they are capable of universal movement and tilting, and are equally available for direct or indirect examination of the eye or retinoscopy.

By an "ombasine" form of sight-hole the tunnel through the mirrors and their septum is reduced to the thickness of a single mirror to the great advantage of the observer, further, the mirrors are so hung that they are never flatly applied to the instrument, therefore it is almost impossible to break them by any of the ordinary accidents an ophthalmoscope is liable to, short of crushing violence.

The driving wheel has been made of a large and convenient size, and is tilted with a pupillometer and sclerometer for the testing of colour vision.

A steel loop shaped handle is part of the instrument and folds by a spring hinge, when it is folded it surrounds the mirrors and protects them, so that a case is not an absolute necessity.

When closed, the ophthalmoscope measures only $3\frac{1}{2}'' \times 1\frac{1}{4}'' \times \frac{1}{4}''$, its weight including case is under $2\frac{1}{2}$ oz. It is therefore the smallest complete refraction ophthalmoscope yet devised.

CORRIGENDA

In Prof Langard's paper (Sept No.) the following corrections are needed in Table on page 333—Col 5, read Plimmer not Plumlea. Col 7, Insert after words periphery, third line from bottom. Cels 9 & 10, for rhizoplast read rhizoplast.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co., Calcutta.

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Annual Subscriptions to the *Indian Medical Gazette*, Rs 12 including postage, in India. Rs 14, including postage abroad.

BOOKS, REPORTS, &c, RECEIVED

The Assam Sanitary Report
The Assam Dispensary Report
The Madras Sanitary Report.
The U. P. Sanitary Report
The Punjab Sanitary Report
The Madras Vaccination Report
The Bengal Vaccination Report
The Chemical Examiner's Report, Bengal
The Manila Laboratory Report.
The Yellow Fever Institute Report.
The Phipps Tuberculosis Institute Report
The Burma Hospitals Report

LETTERS, COMMUNICATIONS, &c, RECEIVED FROM —

Col. H. Hamilton, M.S., Umballa. Col. W. G. King, M.S., Madras.
Major Duer, M.S., Toronto. Major H. Smith, M.S., Jullundur. Mr. Hydayat Ulla, Jhelum. Lieut. Powell Connor, M.S., Manipur. Lieut. Easton, M.S., Karnal. Major W. Jennings, M.S., Poona. Major D. Fearnside, M.S., Vellore. Major Maynard, M.S., Calcutta. Major D. Green, M.S., Mymensing. Capt. E. A. C. Mathews, M.S., Cawnpore. Major Browning Smith, M.S., Simla. Dr. J. N. Cook, Calcutta.

Original Articles

ON A PECULIAR TYPE OF INFLUENZA
LIKE FEVER PREVAILING IN
CALCUTTA

BY LEONARD ROGERS, M.D., F.R.C.P., I.M.S.

THROUGH the great kindness of the Resident Medical Officers of the European General Hospital, Calcutta, I have been able to examine blood films from every case of fever admitted during the last year to the public wards and to make short-hand notes and copies of the four-hour temperature charts of all the cases, with a view to ascertaining the real prevalence of the different kinds of fever in India and to obtain material for some day writing an account of their course and differential diagnosis. As it will be a long time before I shall be able to get leisure to analyse the vast amount of material thus accumulated it appears to be advisable to first describe a peculiar influenzal type of fever which has been very prevalent during the last few months, and which presents certain features resembling typhoid on the one hand and malarial fevers on the other, and consequently may be very difficult to diagnose when first encountered, while it is likely to be spread beyond Calcutta before long if it has not already done so.

The appearance and spread of the disease in Calcutta—Throughout my inquiry blood films were kindly taken by the Assistant-Surgeons on admission of the patients to hospital before any quinine was administered to them, although in many instances they had taken the drug before coming for treatment. During the months from September to January, 1905 in the great majority of the intermittent and short remittent cases malarial parasites were found, while in the next three months from February to April the number of both malarial and other short fevers was very few. In the month of May several short remittents were admitted from one ship in the Hooghly river, and they at first resembled very closely in their general appearance cases of typhoid fever, but the temperature fell to normal on the seventh day in several of them, although others ran on to from ten to fourteen days, and in some of these I cultivated from the ven blood organisms which appear to belong to the pain-typhoid group, although I have not been able to test them fully yet for want of some of the necessary culture materials. In June a number of heat-stroke cases were met with (which are of great interest, but must be reserved for future communication) and at the same time a few cases were met with of patients coming in with a high temperature which fell to normal in from twelve to twenty-four hours, and which I at first thought might be mild cases also due to the severe heat wave then being experienced.

Two of these cases, however, came from a ship on which I was informed by the Acting Port Health Officer, Dr W. C. Hossack, a large number of the crew had been attacked by a very short influenzal type of fever with sudden onset. At the same time a further series of short remittents with the peculiar temperature curve, to be described presently, began to be admitted from a number of vessels and ran a course of only six or seven days, while no pathogenic organisms could be cultivated from their blood. Moreover, several patients were attacked with this type of fever while in hospital, and this fact together with the frequency of pains in the body and limbs and occasional convulsions, etc., lead to the conclusion that the outbreak was one of an influenzal nature. During June and the greater part of July almost every case came from either ships in the docks or river or occurred in persons whose work took them into contact with such ships, such as pilots, etc., but throughout August and the greater part of September up to the date of writing a number of cases have been admitted to both the European General and the Medical College hospitals from various parts of Calcutta, while I have also seen several private cases in consultation in which typhoid fever was suspected and a serum test denied.

Variations in the Type of the Fever—The marked characteristic of the disease, which is well illustrated in the accompanying charts, is the peculiar temperature curve due to the fever reaching a high point at the onset, declining to a variable but often usually marked degree during the middle of its course, only to rise again in a most typical manner the day or two before the final fall occurs. Occasionally this intermediate decline of the fever curve may be so marked as to nearly reach normal for a day or two and yet rise again to 103° or 104° F., only to finally fall the next day, while every gradation from this extreme type to a curve presenting only the slight saddle-back like remission shown in chart I, and which consequently simulates very closely the continued type of true typhoid fevers, have been met with in the present series of cases. In the milder cases, in which this temporary remission is most marked, the patients commonly come in only during the final rise, and giving a history of a few days fever with intermission, beginning with rigors, and then temperature falling in a day or so under quinine treatment, it is only natural that they should frequently be taken for malarial fever, and consequently if this peculiarity is not known and parasites are not sought for, they are certain to be returned under the convenient and very elastic heading "24a—Ague," especially during the rainy malarial season. So frequent have these terminal cases been in that they comprise just half of the present series of cases, and deserve a separate description.

The Typhoid like Group—It will be most convenient to describe first those typical cases which have come into hospital sufficiently early to show the characteristic saddle-back remission of temperature, of which I have tabulated twenty-six cases with fairly complete notes, taking up the points as far as possible in the order in which they would be met with in the course of a case.

General Appearance on Admission—The very great majority of the patients being sailors were well-nourished men. The face was flushed and often markedly so, and the expression dull and listless and very suggestive of early typhoid, while in the more severe cases the high and nearly continued type of fever also pointed to that disease, while in several cases abdominal pain and somewhat suspicious-looking roseolar spots were also present. In several such cases the general aspect of the disease was so suggestive that blood was taken for the Widal test by the medical officers, but in every case the reaction was negative, and the subsequent short course of the disease confirmed the correctness of the results.

History of the Onset—On next inquiring into the history of the case it was found that the onset was almost invariably quite sudden, which was against typhoid, although in India the latter disease may also sometimes be ushered in by a rigor and the typical gradual onset of cold latitudes is not nearly so constantly seen. A history of rigors was obtained in ten out of the twenty-six typical cases, and of chilly feeling at the beginning of the illness in three more, while in five no history of rigor could be obtained, and in the remainder there was no note made on this point. Closely similar figures were obtained in the twenty-six "terminal" cases, eleven having had rigor and two chilliness, while in two no history of either could be got. In most of the cases in which there was no history of actual rigor, as well as in some cases with such a history, it was noted that the disease began suddenly with headache often of a severe nature, so that the suddenness of the onset of the symptoms is one of the most constant and characteristic features of the disease. The rigors were usually only met with at the beginning of the disease, and but rarely recurred,—a point of importance in differentiating the disease from malarial fevers.

Headache—This was the most constant symptom met with together with pains in other parts of the body. Headache was noted in twenty-two out of the twenty-six typical group and in twenty out of the 26 "terminal" cases, while in the remaining cases there was no note made on this point, so that it was never recorded as being absent. Further in the majority of the cases it was noted as being of a severe nature, while in every case in which the location of the pain in the head was recorded it was found to have been in the frontal region, doubtless on account of the mucous membrane of the frontal sinuses being involved by this catarrhal affection. I look on the constancy and severity of frontal

headache as an important point in favour of a diagnosis of influenza as opposed to malarial fever, for the symptom was almost as frequently met with in the milder "terminal" cases as in the more severe typical typhoid-like ones, while I find on reference to my tables of malarial cases that headache is much less constantly noted in them than in the influenza ones, while its location is considerably more variable, being not infrequently temporal or occipital.

Vomiting—On the other hand sickness was much less frequently recorded in the influenza than in the malarial series, having been only noted in the histories of four out of fifty-two of the former, while it was frequently noted to have been absent. On the other hand it very commonly occurs in both benign and malignant tertian malaria, so that the presence of this symptom is in favour of a diagnosis of malarial fever as against influenza.

Pains in the Body and Limbs—This symptom ranks in frequency and importance with frontal headache itself in the histories of both the typhoid-like and "terminal" cases. It was most often recorded as affecting both the body, especially the back and limbs, and next most frequently in the limbs or joints alone, while in two cases it was noted to occur in the back alone, and in thirteen more in the back, other parts, and in two more in the abdomen alone, and several times it occurred at the back of the eyes in addition to other places. These pains, moreover, were commonly noted among the initial symptoms with which the disease suddenly commenced, and they were much more constantly met with and of greater severity than the aching pains which occasionally accompany the fever of malarial origin.

The Typical Character of the Tongue—Ten years ago, when examining all the fever cases in a native regimental hospital for malarial parasites, I met with an outbreak of influenza and noticed that the latter disease could nearly invariably be distinguished immediately from malarial fever by the character of the tongue, and in the present outbreak I have been able to verify this point, which has proved of great diagnostic value in the General Hospital cases on account of its constancy. The characteristic feature of the influenzal tongue is a thick coat of fur in the centre contrasting with a very red and often angry, raw, looking edge, which is sometimes also indented with the teeth. The dorsum may also show a "strawberry" appearance produced by red papillae appearing through the coating of fur. The conspicuous red edge is, however, the characteristic feature of the tongue, in which it differs from the thin uniform furring in malarial and the thick uniform coating of the organ of typhoid fever.

Rashes—As the present outbreak presents some points of resemblance to dengue it is important to note carefully the appearance of the rashes seen in a few of the cases. They were

variable in their character and distribution, as well as in the period of the disease when they were seen, and in these respects differ widely from the nearly constant and typical rash of dengue fever as described in text-books. Of the 26 typical cases admitted in the earlier stages of the disease this symptom was observed in only six, and in three of these it was limited to a few spots on the abdomen noticed when looking for typhoid rash, while in two of these it was mentioned that they resembled mosquitoes. In the other three cases a definite rash was present on the arms and legs, and in one of them also on the body, which were described as being "mottled" or "measly." In one it was observed on the second day of the disease, while in the other two it did not appear until the sixth and eighth days respectively, being evidently of the nature of a post-influenzal rash appearing late in the disease. In the twenty-six terminal cases a few pink typhoid-like spots were noted on the chest and abdomen, in one case and "mottled" rashes on the arms and body, in two others on the third day of the disease. Rashes, then, formed a very exceptional and variable feature and corresponded in their characters with those occasionally occurring in influenza, while they differed markedly in their incidence from that of dengue fever.

Coryza.—Running from the nose and eyes was only very exceptionally met with in this outbreak, so much so indeed that lately when on the look-out for a case presenting these symptoms for the purpose of trying to isolate the influenza bacillus, I have failed to find one, so that in this respect the disease differs from a typical outbreak of influenza.

Lung Affections.—Here again involvement of the lungs has been only very exceptionally noted, signs of bronchitis having only been detected in three cases, and in none of them has definite pneumonic symptoms ensued, another point in which this epidemic differs from the common type of influenza. This may possibly be due to the occurrence of the disease during the hot season of the year.

Spleen and Liver.—In only one case was the liver enlarged to one inch below the ribs, while in only three could the spleen be just felt below the ribs on deep respiration, so that distinct enlargement of the spleen is a point in favour of malarial fever as against influenza.

Pulse.—Another very frequently observed point was the slowness of the pulse during even high fever, when it usually ranged from 70 to 83 per minute even with a temperature of 103 or 104, while it scarcely ever reached 100. After the final decline of the fever a pulse of 60 or even less was commonly seen. In this respect the disease again simulated typhoid.

The Temperature Curve.—Having described the principal symptoms of the disease we next come to the course it runs, which is best illustrated by the temperature curve, which presents

most characteristic features in the typhoid-like group coming under observation during the first day or two of the disease. This is well shown in chart I from a patient who was attacked while in hospital, so that the sudden initial rise to 103 is included. On the second day the temperature declined one degree from 102 to 101, but then pursued a very continued curve for the next three days, exactly simulating that of a somewhat mild case of typhoid fever, and the patient presented a flushed face, a tremulous furrowed tongue, severe headache and a few suspicious-looking pink spots on the anterior abdominal wall. His blood was therefore sent for a serum test for typhoid, but a negative result was obtained, which, however, at such an early date would not necessarily exclude the presence of the disease. On the evening of the sixth day the characteristic terminal rise of temperature commenced, reaching 104 the next morning, and then fell gradually to normal about twenty-four hours later. It is the high initial and final rise with a lower level during the intermediate days that gives the typical "saddle-back" character to the temperature curve. Chart II shows a similar curve in a milder case, the intermediate decline being more marked and the temperature falling gradually to 99 the day before the final rise to 103. Chart III again illustrates a still more marked and lengthy remission, the temperature remaining at between 99 and 100 throughout the fourth and fifth days, yet rising again to 103. On seeing this chart on the afternoon of the fifth day I observed that there would be a high rise before the fever ceased, and on being asked to note what I thought would be its course I marked the dotted line shown in the chart, and it will be seen that it closely corresponds with the actual course except that the rise took place one day later than I anticipated, so characteristic is the final rise in this fever. During the remission, especially if it is marked, headache and pains become somewhat less, and the patient feels better, so that it is easy to understand how such a large proportion as half the cases, believing the fever to be subsiding, remained at home, but when the temperature rose once more often to a higher level even than at the onset, they came to hospital only for their fever to cease on the following day.

Terminal Cases.—It is these cases which form the group which I have referred to as "terminal" and which are so easily mistaken for malarial fever. Chart IV illustrates one of these cases coming to hospital early in the final rise of temperature, while Chart V shows another coming just after the final rise had begun, and simulating very closely the flattopped curve of a malignant tertian malarial paroxysm, after the first rapid rise, a resemblance which is further enhanced by the history of sudden onset with rigor and borne out by the steady fall of the temperature during the

twenty-four hours after admission under quinine treatment. In other cases the patients only came in just as the final decline was taking place, and these again simulate the termination of a malarial fever. Benign tertian malarial fevers are more easily distinguished from terminal influenza than are the malignant tertian type, for in the former the decline of the temperature curve is much more rapid as a rule than in influenza or malignant tertian cases, occupying only four to eight hours instead of sixteen to twenty-four or more.

Duration of the Fever—Almost as characteristic as the temperature curve is the uniformity of the duration of the disease. Thus out of thirty-seven cases admitted during the earlier stages in no less than twenty-nine the fever lasted either six or seven days, and in three more it was five days, while one case terminated on each of the fourth, eighth and twelfth days respectively. Similarly among the terminal cases twenty-two out of thirty-eight ran a course of six or seven days from the onset, although only in hospital for the last day or two of the fever, three lasted eight days, while four, two and three cases terminated on the third, fourth and fifth days respectively, and four later than the eighth day, showing that this class was on the average of a milder nature than the typhoid-like group and consequently were more liable to only come to hospital during the final terminal rise of temperature.

Duration of Stay in Hospital.—Two-thirds of the cases admitted in the early stage of the fever remained in hospital between one and two weeks, while the same proportion of the terminal ones were discharged within a week of admission. Considerable weakness and lassitude follows the attack, but convalescence is fairly rapid after the fever ceases, and it is quite rare for a recurrence to take place within a short time.

The Blood Changes—The examination of the blood for malarial parasites is of primary importance, for although the temperature curve in cases admitted early in the disease very soon serves to exclude malarial fever, yet in the terminal cases it affords no such help. As the great majority of the patients were sailors, who had not taken quinine before admission at any rate in large doses, the absence of the malarial parasites in the blood of every case was of great value in excluding malaria as early as possible, thus allowing smaller doses of quinine to be given than are necessary in the latter disease, much to the comfort of the patient. I also made differential leucocyte counts in upwards of seventy cases in the hope of getting help in the diagnosis, but the results have been very disappointing as most variable counts were obtained, a large mononuclear increase, quite as marked as in many cases of malaria, being met with on the one hand, and a lymphocyte increase, without any large mononuclear excess as in typical

cases of typhoid fever, frequently occurring on the other, so that an elaborate analysis of the figures will not serve any useful purpose here, but will be reserved until I have been able to work out the results of leucocyte counts in the whole of the fever cases examined during the last year. One feature of interest, however, deserves mention, namely, the very marked reduction of the total number of leucocytes during the fever, which was quite evident in many of the cases during the leucocyte counts in stained films, and was confirmed by hæmocytometer counts in a few, which showed that the total leucocytes may fall to from 3,000 to 4,000 per cm, or sometimes even below the former figure, but that they rapidly increase again after the fever subsides. As a similar reduction also occurs in the later stages of typhoid and malarial fevers this again is of no help in the diagnosis, but as the course of the fever and the history of its onset in cases seen early is so typical when a few cases have been watched, no help, other than the Widal test in the more severe cases, and an examination for malarial parasites in the milder terminal class, is likely to be required. A reduction of the leucocyte is a well-known feature of uncomplicated influenza.

Differentiation from Dengue Fever—It will be seen from the above description that the present outbreak presents several points of resemblance to dengue fever, namely, in the frequent severity of the pains in the back, limbs and joints, and in the peculiar remission in the fever curve in many of the cases. The pain, however, does not seem to have been on the whole as sufficiently constant and severe as in "Break-bone fever," as dengue is sometimes called, nor did they return with the final rise of fever and continue during convalescence in the characteristic manner of the latter affection. Again, in dengue the remission of fever is said to set in abruptly and to be complete, the temperature remaining normal for two to four days, while in the present outbreak only a slight saddle-back remission occurred in the severer cases, and in those where it was more marked the temperature always fell gradually through two to four days, and only rarely quite reached the normal, or if it did, it was only for a very short time. Further, the final rise of temperature is said to be often slight or even absent altogether in dengue, which was very rarely the case with the fever described above. Once more the terminal tubercloid rash on the hands and arms is one of the most constant and characteristic features of dengue, being often followed by peeling while an erythematous rash is also frequently seen in the early stages of the fever, yet we have noted that rashes were very exceptionally present, and variable in their characteristic appearances and position in this Calcutta fever. Again, no swelling and redness of the joints was noticed in any of the cases, although said to

ON A PECULIAR TYPE OF INFLUENZA-LIKE FEVER PREVAILING IN CALCUTTA

By LEONARD ROGERS, M.D., F.R.C.P., I.M.E.

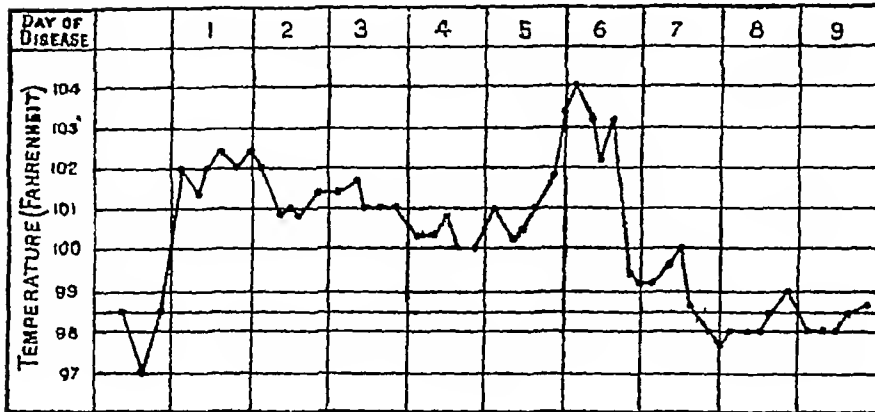


CHART I

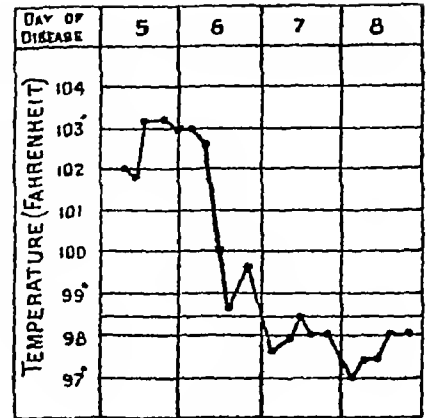


CHART IV

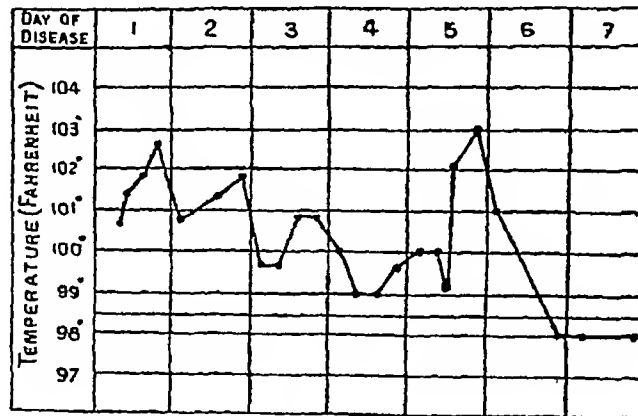


CHART II

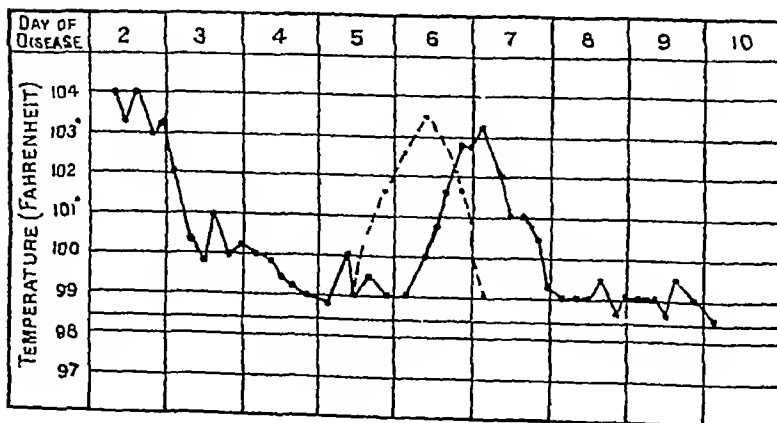


CHART III

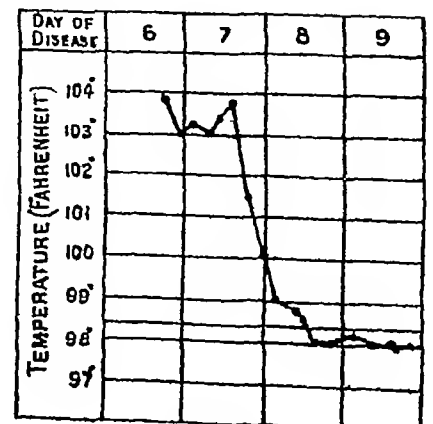


CHART V

occur in dengue, but it appears that this feature was also absent from the Amoy outbreak described by Sir Patrick Manson,—so too much stress must not be laid on this point. The pulse is also said to be very rapid in dengue, while it was markedly slow for the temperature in this series, and the hæmorrhages and epistaxis of dengue were also absent except for the latter symptom having been once noted in the General Hospital cases. Lastly, the comparatively slow spread of the disease through such a crowded community as that of Calcutta during several months is much more like that of influenza than of the text-book description of dengue, which is said to burst on a town and to affect at least seventy-five per cent of the inhabitants within a very few weeks. It is also worthy of note that I have met with occasional cases of fever presenting the peculiar temperature charts of this outbreak during the last four or five years in Calcutta hospitals, and, recognising their difference from the more common types of fever seen here, have been long on the look-out for further cases for study, so that this sporadic occurrence

is also in favour of influenza as against dengue, which dies out nearly as rapidly as it appears.

Thus we find many of the most constant symptoms of dengue fever either absent or rarely seen, while the severer cases with only slight remission of a continued type of fever very closely correspond in all particulars with Goodheart's description of the typhoid-like group of influenza cases in Clifford Allbutt's *System of Medicine*, and although in the absence of bacteriological confirmation it is impossible to definitely decide in favour of this outbreak being one of influenza, still I think the cases taken as a whole correspond more closely with influenza than with any other known affection, although the possibility of it being a distinct disease must be admitted.

In conclusion it is my pleasing duty to acknowledge the very great kindness of Captains R. P. Wilson and J. G. P. Murray, I.M.S., Resident Surgeons of the General Hospital, in permitting me to examine their cases and to make use of the notes and charts, and also for much valuable information on various points.

MEDICAL CASES FROM MADRAS GENERAL HOSPITAL

By C. DONOVAN,

MAJOR, I.M.S.,

Second Physician

1. MALARIA.—As last year, special attention was paid to this fever.

The diagnosis was invariably passed on microscopical examination of the blood and the find of the malarial hæmatozoon therein.

During the year 71 cases were admitted, giving a percentage of 5.57 (Europeans and Eurasians 5.08 per cent, natives 5.75 per cent). In the previous year 83 cases, a percentage of 6.3 were registered, there was therefore no marked variation in number.

The following table shows the different forms of fever—

of no doubt. A few cases of malaria of long standing were induced to remain in the wards for lengthened periods and in these, relapses occurred about three weeks after a 30-grain dose of sulphate of quinine. As reinfection in hospital was most improbable, attempts were made to find the latent forms of malaria giving rise to these relapses. For this purpose punctures of the spleen were made and in the blood so obtained discovery of forms hitherto undescribed was noted.

It is especially in the benign and malignant tertians that I can speak with any certainty of these latent or dormant forms of malaria.

They arise, it is presumed, parthenogenetically and would correspond to Grassi's "die hypothetische parthenogenetische generation."

I describe, what I take to be the latent forms of benign and malignant tertian.

	Benign tertian	Malignant tertian	Quartan	Mixed quartan and malignant tertian	Mixed quartan and benign tertian	Total
Europeans and Eurasians	6	11	1			18
Natives	22	23	6	1	1	53
Total	28	34	7	1	1	71

Most of the cases came from Black Town, the majority being of the malignant tertian type. Quartan is apparently making its way gradually into the north of Black Town from Ennore and Thuvottiyur, as some of the patients affected with this species of plasmodium lived from this locality, their history was clear and admitted.

Malignant Tertian—In blood drawn from the spleen during life and stained by the ordinary Romanowsky method, spherical forms about 5μ in diameter are found in small numbers, the protoplasm is finely reticular in nature of a very faint sky blue, contained within this is a compact or very loose thread-like chromatin mass.

and a few grains of pigment generally in clumps, and rarely scattered. Occasionally the organism takes the amoeboid form. It is presumed that these forms develop from the usual crescent-shaped macrogamete, which becomes smaller, bean-shaped and oval, a gradual change taking place in its compact and dark staining properties. To continue the theoretical latent phase, forms are developed in which the chromatin mass divides into several merozoites, which finally are set free in the usual amoebula stage of the asexual generation and herald a rise of temperature and a relapse.

Benign Tertian—Here the forms are larger, about the size of the red blood corpuscles, 7μ in diameter, with faintly stained reticular protoplasm and loose chromatin, thread-like in appearance surrounded by a colourless halo; the pigment is in small quantities scattered here and there. The chromatin then divides into four or five portions and finally into several. The chromatin masses form into merozoites which become free at the suitable moment.

Quartan—I have not satisfactorily worked out the changes in this form of malaria.

2 **PIROPLASMOSIS***—There were 110 cases of this disease admitted during the year, a percentage of 8.62. Among Europeans and Eurasians 16, a percentage of 4.52, and among natives 94, a percentage of 10.20, that is to say, that in the native wards piroplasmosis was twice (10.20 per cent) as common as malaria (5.75 per cent). Of the number admitted 27 died from broncho-pneumonia, cancerum oris, peritonitis or general infection, seven were removed moribund, and in only one case was there an apparent cure, this result not being due to any special medication. Another patient was to all appearance perfectly well for four and-a-half months when he had a relapse.

Two of the fatal cases were due to splenic puncture, one from hæmorrhage from the spleen and the other from a perforation of an artery in a peritoneal adhesion over the spleen. After the second fatal case, puncture of the spleen was at once stopped and the diagnosis since then has been made from peripheral blood. Here, in 75 per cent, the double chromatin parasite is found in and among the leucocytes, both polymorphonuclear and mononuclear, in small numbers.

Since beginning splenic puncture, 170 cases were so operated upon. In 124 piroplasmata were found, three proved fatal, an accident due to the poor coagulation of the blood, which the exhibition of calcium chloride and adrenalin was ineffectual to frustrate. The disease is of a markedly endemic nature, most common in Black Town and in the district, at Rameswaram, a few cases were admitted from Salem and some villages 20 or 30 miles outside Madras.

During the past year L. Rogers has made the important discovery of developing trypanosoma forms out of the protoplasma of man in a citrate of sodium solution. Being unaware of the details of Rogers's experiments, I tried 0.5 solutions of sodium citrate and sodium chloride. My attempts proved ineffectual in bringing about the desired change, but Christophers succeeded by using a 10 per cent solution of the citrate salt alone. This find has not so far thrown any doubt as to Laveran and Mesnil's determination of the parasite in question, on the other hand it confirms in a way, Schaudinn's theory of the trypanosoma stage in piroplasmosis in general. The transmitter of the disease has not up to the present been met with, a probable agent was, however, brought to my notice by Christophers. This was a large tick, as far as I can judge, of the genus* *Aargas*. It is said to suck human blood especially at night and to be common in the railway stations of Kalahasti and Tirupati where, it is a source of considerable annoyance to the native passengers in the third-class waiting-rooms of these stations. Some specimens were received from these localities and were fed on piroplasma cases. Even in the day they greedily attached themselves to the patients and in ten minutes were full of blood falling off when satiated.

The blood from the ticks thus fed was examined microscopically for several days afterwards, but nothing definite was found.

There is a marked similarity in piroplasmosis to typhoid fever when the temperature is of a continuous type, and in two of my cases even a positive reaction with Widal (1 in 20) was obtained, but the subsequent course of the disease and splenic puncture removed all doubt as to the diagnosis. Treatment as heretofore has eluded all success.

3 **BANTI'S DISEASE**—A case of this interesting disease was treated in my wards. As far as I can gather this is the first observed in our hospital. There was anæmia, extensive enlargement of the spleen, and very slight of the liver. No ankylostomata were found in the stools, and no eosinophilia, or malarial parasites or piroplasmata in the peripheral or splenic blood.

The patient, a native boy named Munisami Naricker, aged about fifteen years, though he claims to be four years older, is a gardener and lives in Chintadripett. He was admitted on the 20th October for a tumour in his abdomen, offering a sense of weight and oppression while at his occupation, dyspnoea on exertion and anæmia as remarked by his relatives. The patient gives a history of fever with rigors every alternate day for a month and-a-half. The fever left him without his having taken any medicine, about a fortnight before his admission into hospital. A week after the commencement of the fever a hard swelling was noticed in the left hypochondrium.

* Otherwise known as infection by Leishman Donovan bodies.—ED, I. M. G.

* Since identified as *Ornithodoros savignii*, Pocock.

which steadily increased to the present size, occupying more than half of the left half of the abdomen. His family history is good, both parents being alive and healthy. He has an elder brother and two sisters all in the best of health.

The boy is fairly well nourished, though with marked anæmia of his mucous surfaces. Skin dark, small papular eruption all over the body, especially on the thighs and abdomen, and diffuse and irregular patches of pigmentation over the chest, giving it a marbled appearance. The lymphatic glands are not enlarged and there is no cedema present. The heart sounds are normal, no hæmic murmur but *bruit de diable* is audible. Tongue fairly clean and moist, pale and flabby indented by marks of the teeth, bowels move twice daily. For the last fifteen days he has been passing more or less pure blood in his stools. Spleen much enlarged, extends to the symphysis pubis and two inches to the right of the umbilicus, smooth and very firm to the touch.

Liver slightly enlarged, its lower border barely an inch below the costal arch. There is very slight fluid in the abdominal cavity. Urine, acid, specific gravity 1.010, slight pigment, no albumin or sugar.

There were 3 million red blood corpuscles to the cubic millimetre, leucocytes 5,000. The differential leucocyte count gave —

	Per cent	
Polymorphonuclears	124	70.66
Mononuclears	23	3.83
Transitions		
Lymphocytes	127	21.16
Eosinophiles	22	3.66
Myelocytes	4	0.66
	600	99.97

There were two normoblasts and six megablasts in a leucocyte count of 600, the red blood corpuscles varied much in size, megalo-, micro- and normocytes, the colour of the last variety being pale. No poikilocytosis present.

The hæmoglobin count equalled 55 per cent, giving a colour index of 0.91.

The spleen was punctured on 31st November, but nothing definite found.

The temperature while in hospital was more or less normal, rising only once to 100° F on the third day of admission. The boy was very impatient of being in hospital and absconded on 10th November, thus giving no opportunity for a lengthened study of his case.

The enlarged spleen was not due to protozoal miasis or malaria, as neither protozoa nor malarial parasites were found in the peripheral or splenic blood, and there was no mononuclear increase, so pathognomonic of these diseases. The anæmia was not secondary to ankylostomiasis, no ova or adults of these helminths being found in the stools, or the concomitant eosinophilia in the blood.

‡ MYXEDEMA.—A case of this infrequent disease was admitted on 29th May. A clerk in

the Customs office, by name Satagopa Mudali, aged 37 years, was admitted for swelling of the whole body, shortness of breath, general bodily weakness, difficulty and thickness of speech and pain in the chin and back.

The family history was good, no record of tubercle, syphilis or gonorrhoea.

About seven years ago the patient first noticed swelling of his face, later on cedema of his face and legs supervened. Besides these no other symptoms arose to hamper him in performing his work. By degrees other parts of the body became swollen, and he then found he could not walk long distances and at the same time his speech became thick on account of the cedema of the mucous membrane of his mouth, lips and tongue. Latterly, he began to have shortness of breath on the slightest exertion and marked muscular weakness rendering him incapable of standing, and in his attempts at walking being upset by the smallest obstacles. He underwent treatment by several native physicians without any relief, but he had not tried the so-called European medicines and sought admission into hospital for a trial. The patient is a middle-aged man of small stature, very podgy in appearance with swelling all over the surface of his body, particularly well marked in the face, with bags underneath his eyes, on the front of his chest where lumpy masses protrude over the clavicles, and on the back of the hands and the dorsum of the feet. The swelling is of a peculiar nature, more of a tough doughy feel than ordinary cedema, not pitting on pressure. Skin dry and scaly, very thick to the feel when taken between finger and thumb, simulating tanned leather. Hands characteristically spade-like. Lips swollen and pouting, the buccal mucous membrane is considerably cedematous, protrudes into the mouth and overlaps the teeth, much impeding mastication. Gums spongy, tender and bleed easily, the tongue is large and dirty. Face broad, flattened out and expressionless, features quite stolid, eyes sunken and embedded, as it were between huge swollen eyelids, the upper lids overhang and reduce the palpebral fissures to mere slits, the brows distinctly arched in the effort to keep the eyes open. The nose and ears are not implicated. The hair has fallen off all over the body, but there are a few stumps on the head, these are dry, rough and break easily, possessing no gloss. The gait shows no abnormality except that incidental on the huge size of the body and legs. Sensation of skin is slightly impaired, response to pricks being elicited slowly. The fine movements of the fingers not much affected. Can pick up a needle from the floor and button his shirt. He writes slowly but a legible hand. His voice is dry, thick and monotonous, speech slow, the words being uttered at measured intervals. The patient is to a certain extent lethargic, very dull in receiving impressions and every question has to be repeated. He is not garrulous nor

short tempered; but on the other hand disposed to be dismally jovial. Heart sounds slow and feeble, nothing else abnormal. Respiration normal, on exertion only does he complain of shortness of breath. Appetite unaffected, bowels constipated. The urine is voided frequently, contains very slight albumin and phosphates. He was put on thyroid extract, three tabloids, of 5 grains each, a day. He showed marked improvement on this treatment, the swelling about the eyelids, hands and feet becoming much reduced and wrinkles appearing. His weight decreased by 2 lbs in four days. The temperature previously being 98° F now rose to 100° F in the morning and a degree higher in the evening. His heart sounds too improved. On the night of the 5th June, about midnight, the patient to all intents and purposes progressing most favourably, complained of great difficulty of breathing and died suddenly at 2 A.M. on the 6th June. He was eight days in hospital and had taken 105 grains of thyroid extract during this period. The effect of this drug was very closely watched, but nothing untoward was noticed till a few hours before death. This unfortunate ending was evidently due to the medication.

5 **TYPHOID FEVER**—Out of a total of sixteen admissions for this disease, a single case only occurred in the native wards, and proved fatal. The remainder were Europeans and Eurasians, amongst whom one death occurred. As remarked under the heading of *piroplasmosis*, there is at times a very close resemblance between it and typhoid, a similarity also noticed by Captain Symons, I.M.S., the Fourth Physician, who I hope will comment on this incident in his report for the year. The pyrexia is typically typhoid in character for about 21 days, succeeded by a period of apyrexia for a variable time, a fortnight or three weeks. The patient is then discharged, but a month hence seeks re-admission for fever and pain over the spleen. The pyrexia on the second occasion is atypical of typhoid, and puncture of the spleen, now manifestly enlarged, clears up the diagnosis. In such cases Widal is usually negative but, as mentioned previously, two patients on their first admission gave a positive reaction, thus disarming for the time any suspicion of *piroplasmosis*.

6 **ULCERATING GRANULOMA OF THE PUDENDA**

—A ward boy was admitted for this complaint in his mouth, and being struck by the appearance of this granuloma to that occurring in fish suffering from *microsporidia*, I took scrapings from the human subject and found protozoa, of whose definite location in this order of low organisms I at present am doubtful. These parasites are always associated with this disease. Half a dozen different patients, the victims of this affection were examined with positive results.

I give a very short preliminary account of their appearance.

In scrapings from the deeper parts of these growths, small forms, oval in shape, about 1 $\frac{1}{2}$ to 2 μ in length are found in the epithelial cells of the stratum malpighii or in macrophages usually in large numbers, either scattered or in small round compact groups. They stain badly with methylene blue, hæmatoxylin and the different modifications of Romanowsky. By the last mode of staining, the cells possess a well-defined contour with a dark pink protoplasm therein, in the centre of which there exists a long flatly oval very dark pink chromatin mass. The epithelial cell containing the bodies, bear a strong resemblance to mast cells, the presence of which has been brought to notice by Galloway in his lucid description of the histology of this particular granuloma. The organisms as far as studied by me appear to be epithelial-cell parasites belonging to the Gregarine order of the Sporozoa.

HOW TO CURE CHOLERA

By P. W. O'GORMAN, M.D., M.R.C.P., D.P.H.,

I.R.I.P.H.,

MAJOR, I.M.S.

UNDER this homely title, as in my article on Enteric Fever (*I.M.G.*, May, 1904), I wish to emphasise the difference between ordinary "treating" and *curing*,—the essential variance consisting in the application of rational therapeutic principles against those dependent on empiricism. Now, cholera is a disease that has ever proved a most perplexing problem to medical men, and the alarm and horror its presence invariably excites, even in the best regulated minds, do not conduce to rational thinking. Mysterious in its origin, mysterious in its propagation, mysterious in the results of its treatment—now easily amenable to certain drugs, now astonishingly fatal under identical treatment—it is no wonder that confusion and despair seize on us, and we give up the hopeless struggle in disgust. There is probably no disease in the world that has so vainly exhausted the Pharmacopœia, official and non official, or which has given birth to so many vanuted nostrums. And yet we appear to be as far off a reliable remedy as ever, for no two physicians agree as to treatment, nor indeed does the same physician adhere to his own tested panacea in two consecutive series of cases.

And yet the reason is obvious. We do not utilise to the full the researches of modern science. Practical bacteriology to most of us is as if it never existed, while pharmacodynamics vainly struggles for a reasonable hearing. We are, in fact, still lost in the mists of mediæval conservatism and prejudice. It is my earnest duty here to very respectfully invite the profession to the rational application of scientific principles to the removal of this long standing reproach in the cure of this formidable malady. The terrible epidemic now prevailing in Madras, and the consecutive outbreaks in Lucknow, Lahore and other places, as well as the threatened invasion of Europe through Russia and Germany, may give added weight to this representation. I make no claim to discovery, originality or statistical proof. I am merely the humble follower of our own Indian Medical Service men and of the modern school of alkaloidal therapy. I merely, guided by a pretty extensive experience and a little study, adapt modern rational methods to practice. Many physicians have used some at least of the drugs I recommend, but have used them without sufficient knowledge, and when failure followed, have too hastily condemned them instead of themselves. I, therefore, do not confound the

intellect by appealing to authority, but appeal to *reason* and *established scientific facts*, and beg only their conscientious and persevering application, without the abdication of professional commonsense. Nevertheless, for years past, as opportunity offered, I have tested the efficacy of the method, and been satisfied it is the *only rational method of treatment*. In a recent outbreak, I believe, the only two cases, out of three thus treated, that recovered, owed their lives to it, and the third (an infant) only relapsed after partial recovery for want of nursing, all of some dozen others died. This, however, is not saying much, and as I said before I do not rely on these successes. "Tis not in mortals to command success, but *deserve it*." I beg to strongly commend its trial to those whose opportunities are wider, and whether successful or otherwise, ask them to kindly *publish their results*.

II STAGES.—Cholera may be divided into three stages, the preliminary diarrhœic, the algid or collapse stage, and the stage of recovery or reaction. It is of the very highest importance to *note the stage* when called to a case; the treatment is entirely different in each. Remember there is no sharp dividing line between them, one may run almost imperceptibly into the other; therefore carefully observe the symptoms. Note the face, the eyes (whose blood shot condition may be the only outward indication of reaction. I discovered several concealed cases in Baluchistan by this means), the colour and temperature of the extremities, especially the feet, the colour and perhaps feel of the tongue (the cold feel to the finger, and cold breath are pathognomonic of collapse—remember to immediately disinfect hand), the axillary temperature (it is unnecessary and dangerous to insert thermometer in the mouth, and worse in the rectum—an easy carriage of infection in spite of precautions, which again are apt to be cursorily performed or even forgotten when several cases are to be attended to), the vomit and stools—the real source of the poison (whose watery, milky, chymid, creamy or pus-like, or "rice watery" flocculent appearance are characteristic—in rare cases blood may pass), and of course cramps in abdomen and extremities (in one case during an outbreak, a letter complaining only of "rheumatic pains" and requesting loan of a battery, immediately led me to diagnose cholera and this was confirmed when I at once visited the patient with the necessary drugs). Take care that arsenical poisoning is not overlooked, especially during a cholera scare, the symptoms are remarkably alike, except that there is a characteristic burning sensation in the stomach. I had one such fatal case immediately on return of a regiment from cholera camp, which I was fortunate enough to diagnose and confirm on *post mortem* and subsequent chemical analysis, although I had only a few hours previously assumed charge. Above all, remember *time is life*, there is no time to spare, act quickly and continue perseveringly; and do not give up any case however apparently hopeless—the worst cases recover. On the other hand, an apparently mild case may suddenly collapse and die, especially if fear, presentiment, or abject apathy (non desire to live) be predominant; therefore beware of treating these cases "casually."

III THE INDICATIONS REQUIRED TO BE COMBATED.—Cholera is a gastro intestinal disorder. Koch's cholera bacilli, with probably other virulent colon species, having gained access therein, rapidly multiply and excrete toxins, and it is these poisons which being absorbed set up the characteristic symptoms. *What symptoms?* Those of an IRRITANT POISON, viz, *purging and vomiting*, accompanied by muscular spasms. And it is this rapid and exhaustive drain of fluid from the body which in turn sets up all the other symptoms which constitute cholera. The increased peristalsis excites free and irritant secretion of bile and intestinal secretions, which in turn, aided by the former, excites violent emesis and purgation, and these in their turn, reinforced by a continuation of the irritation, drains into the alimentary canal the serum from

the chylipoietic blood vesicle. Now, be it noted that the other accompanying symptoms are not peculiar to cholera alone: the restlessness, thirst, cold sweats, lividity, frigid temperature, arrest of urine, &c. These are simply and directly due to the oral and rectal evacuations and the ensuing collapse. Other irritant poisons will cause exactly the same. Arsenic is the most familiar, but there are numbers of others, as the various ptomaines from defective meat, fish, milk, cheese, fruit, &c., besides certain other mineral, metallic and vegetable poisons, as oxalic acid, corrosive sublimate, colchicum. Cramps may be caused either by direct action of these or from certain ill understood albumoses from muscular metabolism. *What, then, is the striking difference between the mineral, metallic and certain vegetable poisons on the one side, and the animal and certain other vegetable ones on the other?* Merely that the latter is a *living poison*, multiplying and elaborating within the body, while the other is a lifeless and strictly limited one. The inference is obvious. We can theoretically, chemically neutralise and eliminate the one limited series by definite means; while the other treated on the same principles, i.e., did we know their chemical antidotes, in order to meet their perpetual reinforcements, have to be continuously or never-endingly antagonised. Hitherto, medical efforts have been shockingly wasted, "treating symptoms as they arise," as our text books ordain, and consequently it is all chance whether we cure or not. *What, then, should be our realm in cholera?* Evidently to go to the root, the cause, the fountain and origin of the mischief. Attack and destroy the multiplying microbes that is our first and most important duty. (2) Their neutralise their toxins, which we have now safely limited. (3) And then, to prevent absorption, expel them; if possible, from the intestinal sewerage canal as soon as convenient, remembering the danger of a relapse to the collapse stage. In a word, our clear duty is *antisepsis, neutralisation* (chemical and physiological), *elimination and support* of the system while this is being done and normal action restored. All these may have to be done more or less simultaneously.

IV TREATMENT IN THE DIARRHŒIC STAGE (before any signs of collapse).—In the earliest or premonitory stage, or even when we feel assured the case is really cholera—and it is a wise precaution during the "cholera season," or when there is "a scare" on, or during an epidemic, to assume this—the first thing is to cautiously *eliminate the poison*. In the robust especially, or when indigestible or doubtful food (i.e., easily decomposable or fermentable, as over-ripe fruit, stale food, etc.), or in large quantity has been taken, give a mild saline aperient (*not purgative*). A teaspoonful or two of sulphate of magnesia (particularly the effervescent preparation) in hot water, is the best for reasons I give below. Now, a word of warning, in administering this laxative, use a wise discretion and do not rely on mere routine, and carefully watch the results. I repeat here, as I will have to repeat, again, *beware of collapse*. Hence, if the bowels are acting freely, they are practically empty (of all except serous fluid), and the necessity for further washing out has ceased, and consequently it would be dangerous to resort to further action and so initiate collapse. I would, therefore, not commend this aperient to the general non-medical public.

As a routine practice in *every case* and during *any stage* of the disease, administer in one dose, according to urgency or severity of the case, calomel grs iii to vi, and sodium bicarbonate, grs vi to xii (I prefer the larger dose) placed on the tongue with very little water. If rejected, be sure to immediately repeat each time, until certain the dose desired is retained and, later that its specific action results. *Reasons*—1. Calomel is one of the most valuable drugs we possess. (a) It excites flow of bile whose functions, besides increase of peristalsis and prevention of decomposition, are curative of intestinal lesions and very probably *antidotal* to

toxins (Koch proved this with rinderpest, and other experiments confirm this belief) (b) It is an *intestinal antiseptic and germicide* of a persistent nature. Besides its direct action on absorption, it is eliminated by the intestinal glands and is brought into actual contact with putrid matter and micro organisms penetrated therein, and disinfects them. "It is a very peculiar fact," says Dr Shaller, "that after a single dose of calomel or after a very short period of mercurial treatment even in small doses, mercury can be found in the intestinal canal six months after the last dose has been taken"—(*Therapeutic Guide to Alkaloidal-Dosimetric Medication*, 2nd Ed 1904 p 268) (c) It is *sedative* to vomiting, especially in frequently repeated fractional doses (gr $\frac{1}{10}$ to $\frac{1}{15}$ every half or quarter hour) (d) It is also a useful *diuretic* (e) As an *antiphlogistic* or inflammation reducer it was highly valued by our older practitioners (f) Taken continuously in doses short of toxic, like other mercurial salts it *stimulates the faculties, physical and mental*—(*Treat book of Alkaloidal Therapeutics*, by Drs Waugh Abbott and Epstein, 1904, p 277) 2 Soda aids calomel markedly, prevents salivation and supplies a vital element to the blood. Recommended, despite the alkalinity aiding choleraic bacillary life, probably it excites acid gastric secretion. Note—Salivation under this treatment is rare, but if it occurs can be controlled by small doses of atropine. 3 The *Magnesia* is also (a) cholagogue, and "one of the most efficient, safe and certain of the salines", and (2) both it and calomel are aperient and eliminant, acting mildly and rapidly (within $\frac{1}{2}$ to 2 hours), washing out the rapidly decomposing and poison bearing matter concerned (c) It is also diuretic. Important note—So soon as the motions resume their bilious character, other things being equal, have every hope the patient is recovering. But don't relax your efforts.

At the same time administer *intestinal antiseptics* as rapidly as possible. 1 As in enteric fever, I recommend the *sulpho-carbolates* of zinc, gr ii, sodium gr ii and calcium grs iii, in peppermint or cinnamon water, one or two such doses every one or two hours (the Chicago Alkaloidal Co's combined tablets are osmically pure and very efficacious). They are sedative, astringent, microbicides, and probably antagonistic to toxins. They rapidly check fermentation and sterilise the stools, all offensive excreta being *deodorised* is the great test of their operation. They are harmless in large doses even up to two drams daily, but not less than 30 to 60 grains must be given the first day, and less the following (increasing when the dieting is resumed if necessary). 2 *Copper arsenite* has proved very successful in America, especially in infants. Dr Arnold recommends it combined with corrosive sublimate and morphine sulphate of each gr $\frac{1}{100}$ repeated every 15 or 30 minutes till desired effect. 3 Another combination, for mild cases recommended by Dr Shaller and Abbott, is zinc sulpho-carbolate gr i, codeine sulphate gr $\frac{1}{4}$, hyoscyamine (amorphous) gr $\frac{1}{100}$, and strychnine sulphate gr $\frac{1}{100}$, one every one or two hours till effect. 4 Of the more important *recently introduced antiseptics* I commend (a) *Acetozone* claimed to be "the most powerful antiseptic known," already proved useful in enteric and other bowel disorders (Parke, Davis & Co, Simla) (b) *Alphazone*, claimed to be a decided improvement on acetozone, soluble, stable, non toxic, 75 times stronger than carbolic acid, a 1 to 2,500 solution kills all ordinary pathogenic bacteria in less than one minute—"an ideal germicide" (Smith, Stanstreet & Co, Calcutta) (c) *Medicinal Lact*, non poisonous, non irritant, does not coagulate albumen, germicidal power superior to phenol. In 5 min to 5 min water, 3i every hour or two until effect. Watch effects (d) *Medical Cyllin*, 32 times stronger than carbolic acid with the cholera bacillus (King's College Laboratory Report 1904), and guaranteed 10 times less toxic to man. Unknown in India till I recently introduced it for trial into a dozen of our Punjab Hospitals, and I have great hopes of its

success in all microbial diseases. The last two are now procurable from Kemp & Co, Bombay, and Smith and Stanstreet, Calcutta. Caution—In these phenol derivatives beware of depressant or narcotic effects. They are presumably all alcohols.

Other important treatment in this stage is to take every precaution to prevent onset of collapse. Continue to warm bed, apply sinapisms (on previously damped brown paper—the more thoroughly mustard is mixed, with or without vinegar, the stronger it becomes), or turpentine fomentations to abdomen, to arrest vomiting, purgation and cramps and to stimulate generally. In the earliest stage the dietary should be bland and very limited. So soon as we are assured it is really cholera *absolutely stop all food of any kind*, whether milk, soup, or any other. Moderately cold water only, slightly aerated or plain, may be allowed freely. Excessively cold water or ice does harm by chilling the internal surfaces first and then exciting congestive reaction, thereby also exciting thirst, besides serving to further reduce the already abnormally low body temperature. To refuse water entirely is stupid and cruel, for the exhausted body fluids must be replaced by its absorption as far as possible, otherwise the already thickened blood cannot continue its circulation. But why should we stop all food? For four important reasons (a) Would you give food during acute arsenical poisoning? No, and just because we have an irritant poison inflaming the gastro-intestinal tract, which, like any other inflamed organ, must have quiescence and rest. (b) Food only increases the vomiting and purging and hence the shock and exhaustion. (c) Food cannot possibly be absorbed, much less digested (especially during collapse), and acts as a foreign irritant body. It is therefore worse than useless. (d) Food only affords *pabulum* for the culture of choleraic and colonic bacteria. It is therefore dangerous. Therefore avoid food in toto. There is no fear of killing your patient, on the contrary, it may mean life. I have stopped all nourishment for 3 or 4 days without the slightest harm, and saved the lives of my patients.

In addition, give carminatives, sedatives and as tringents. Chlorodyne (of which I have some scores of reprints), or our Indian variety Camphorodyne, or P D & Co's standardised Choranodyne are very useful. Sulphuric acid and laudanum used to be much in vogue, but although the acid is antagonistic to Koch's bacilli, I don't believe in it much. The Indian cholera pills of camphor, capsicum, opium and asafetida are convenient. I would suggest the substitution of morphine for the crude opium, and the addition of two or three drops creasote as this antiseptic has proved highly prophylactic against camp dysentery and enteric among the Japanese in the present war (each soldier carries his own pills). Colonel E. L. W. of Hyderabad used to strongly recommend quinine as a prophylactic. It acts probably as a germicide. In short, almost any astringent or narcotic may now be given relying mainly on the alkaloid morphine rather than on opium (because it varies in strength from $\frac{1}{4}$ to twice the B. P. standard, so that you never know where you are, and life should not be left to chance).

There is one other patent drug recently introduced that promises extremely valuable help—*Nuclein* (Nucleinic acid is its chief ingredient), "the active principle of life," "the ultimate basic principle of serum therapy" (Abbott), "the stimulator of the nerve centre of leucocytes" (Shaller). It has the remarkable property of increasing (doubling) the bactericidal power of the blood by multiplying even to 75 per cent the polynuclear leucocytes or phagocytes, as well as the red cells (which can be proved by the microscope), and it is at the same time a powerful systemic up builder, stimulating cell growth. It is thus a *physiological germicide and antiseptic and antidotal to absorbed toxins*. Its indication in cholera is thus very insistent. Give it throughout the disease (noting that the effect of a dose passes off in 30–48 hours)—at first, hypodermically (5 per cent

solution), 15 to 30 drops with equal parts of distilled water every 4 or 6 hours. Once reaction sets in, it may be given *per os*, in 10 to 20 drops twice or thrice a day (Alkaloidal Co or P D & Co). **Caution**—Sterilize the hypodermic syringe and needle by boiling or absolute alcohol; and the skin by soap, followed by 5 per cent carbolic solution and cotton wool.

V **TREATMENT IN THE COLLAPSE STAGE**—There is no disease in which collapse is so profound. The indications are exactly the same as already given, except elimination. Add to these the urgent necessity for combating collapse. At this word the ordinary practitioner at once jumps to brandy! He has been taught in college—as the layman has from infancy—that alcohol is the elixir of life. It is my duty to utter the most solemn warning in this paper. *Beware of alcohol in cholera!* I have the firm conviction that a vast number of cases owe their deaths to alcohol; it is truly the elixir of death. For years I have besought my Assistant Surgeons and Hospital Assistants to avoid alcohol in cholera as they would the very devil. They say, 'But we must stimulate and support the patient.' Most certainly, and this is our obvious and most imperative duty. But alcohol is not a stimulant, no more than opium or tobacco. *It is a sedative in small doses and a narcotic, and even 'irrito-narcotic,' in large continuous doses!* It is not a tonic, but a depressant. It is therefore not an antagonist of collapse, but a collapse producer! Dr J. Bari (Physician, Royal Infirmary and Lecturer, Clinical Medicine, Liverpool University), in his recent powerful address on "Alcohol as a Therapeutic Agent" (*B M J*, 1st July 1905), confirms and emphasises every argument against it that I have used in my book on "The Scientific Valuation of Alcohol," and he is not an abstainer. Suffice it that, after the first temporary fling of irritation, alcohol has a paralytic effect on the vasomotor system; and the blood pressure falls, and the body temperature sinks—in fact, the lowest temperatures on record are in cases of alcoholic excesses. On the splanchnic area this is emphasised, and venous engorgement of all abdominal organs results. The heat-regulating centres are deranged, metabolism is seriously impaired, and urea, carbonic acid, and other unoxidised waste accumulate in the blood and tissues, hence the dark colour of the blood and practical suffocation. (Note that cholera post mortem are asphyxia post mortem.) The energy of the heart is wasted, pumping blood into relaxed vessels, and the nervous system is rapidly 'fagged out.' Finally, Professor Sime Woodhead has shown, from the experiments of Deléarde and Laitenen, that it was almost impossible to confer immunity against rabies, tetanus and anthrax on alcoholised animals, and, even when previously protected, they rapidly lost it under subsequent alcoholisation. In fact, alcohol is a 'narcotic-paralytic irritant' toxin somewhat akin to those of diphtheria, enteric and cholera. Behold, then, this "stimulant," this *aqua vite*, still freely prescribed in cholera! Is it astonishing that such cases would die like flies? But the same objection applies to all sedative and narcotics including ether and chloroform, while they also add to the dangers of urine suppression and uremia when reaction sets in. And here I would draw special attention to the danger of the universal practice of continuing chlorodyne, cholera pills and "cholera cures" *ad hoc genus*, once collapse sets in. This is a fatal procedure. It but deepens collapse. How can it do otherwise? This already depressed system is hypersensitive to all lowering agents.

How, then, would you combat collapse? There are practically only two great remedies, atropine and strychnine. It is astonishing how little these enormously valuable drugs are known. These are veritable sheet anchors in cholera. (a) Atropine is not a general sedative as we are commonly led to believe. It powerfully stimulates and quickens depressed action of the heart and lungs, primarily contracts and secondarily relaxes the small arteries, augmenting the blood

in the integument so that the skin flushes thus relieving congestions and hemorrhages, raises the blood pressure, increases the temperature, checks the secretions, such as serous discharges, sweats, &c, and relaxes spasmodic contractions of both voluntary and involuntary muscles, and relieves pain. Lauder Brunton has shown it exactly antagonises the pneumogastric irritation constituting cholera. It is therefore an almost ideal remedy in shock and collapse from any cause. Give hypodermic doses of the sulphate, ranging from $\frac{1}{10}$ to $\frac{1}{20}$ grain, and says Dr Shaller "One need not hesitate to inject $\frac{1}{20}$ to $\frac{1}{10}$ of a grain when proper symptoms (of collapse) are present. Repeat the dose, if necessary, within one hour. It is better still to anticipate this condition and give it at the very first sign of collapse or shock, and in this way one will prevent this very serious condition from coming on." **Caution**—It is wise to give small doses repeated than one or two large doses, the effects can be watched better. In health, $\frac{1}{20}$ grain might prove fatal to an adult, in collapse, however, larger doses may be administered, especially if opium or its derivative, or pilocarpine has been exhibited, as they are antagonistic. "Children of five years and upwards may begin with $\frac{1}{100}$ of a grain, gradually increasing if necessary. In infants $\frac{1}{100}$ grain should never be exceeded, unless the dose has been gradually increased, and it should be guarded always with one half the amount of morphia" (Shaller's Guide). Children bear it proportionally better than adults, blondes are extremely susceptible. Inebriates may become wildly delirious. (b) Hyoscyamine resembles atropine, but is milder, the latter is preferable in urgent cases. I have seen two cholera cases become unconscious and delirious, sleep well and recover. (c) In sudden and dangerous collapse or syncope, $\frac{1}{20}$ grain Glonoin (Nitro-glycerine) by mouth should precede atropine.

2 (a) Strychnine is the most powerful nervine, cardiac, vascular, muscular and respiratory stimulant known, i.e., acting through the nerve centres. It is "the most powerful incitant of the vital functions that we possess," its effect upon the nervous system closely resembles the action of electricity" (Shaller), it excites all the functions of the spinal cord—reflex, motor, vaso-motor, and sensory—the latter being least affected (Potter). The vascular pressure is raised, the pulse strengthened and slowed, and while the vaso-constriction is greatest in the internal (as abdominal) vessels, those of the skin, and possibly the muscles are dilated (Cushny). The internal temperature falls a little, while that of the skin rises. (See *Alkaloidal Therapeutics*.) Surely, then, no better drug exists for cholera collapse. "No remedy," says Shaller, is so strongly indicated in surgical shock and in collapse as strychnine, but only in very large doses. According to Hare not less than $\frac{1}{10}$ of a grain should be employed, hypodermically, every half hour. (b) For children Brucine, quicker yet milder (by $\frac{1}{10}$ th strength) may be used *per os*, grain $\frac{1}{12}$ every quarter hour for infants, till effect (*Alk. Therap.*), older children in proportion, say two to four such doses. (c) To these I may add caffeine, given in addition, in small repeated doses, as a general stimulant and heat raiser.

There is no better or more potent diad in cholera than atropine and strychnine. The only danger is that strychnine would not be pushed enough—therefore, don't fear, give big doses. Remember it is the only chance I have usually injected 10 to 15 minims (about gr $\frac{1}{10}$ to $\frac{1}{2}$) of the *Liquor Strychninae-Sulph* B P, with equal quantities of distilled water, every 4 or 6 hours, with benefit and never harm, and one case was so thoroughly stimulated, his pulse thumped and respiration panted for a couple of days (which I did not relieve), but his life was saved. But, if attendance permits, I would now commend smaller doses, repeated more frequently till effect. If an antidote be required, chloral will at once relieve.

Other important treatment is the usual physical remedies for restoring warmth—hot blankets, hot

bottles or bricks, wrapped in flannel, round body; friction with powdered ginger for capsicum, mixed with flour, and sinapisms to heart, stomach, spine, nape of neck, and calves (blisters to side of neck, over the vagus, have been recommended). Repeated *subcutaneous* or *rectal injections* of warm, sterile common salt solution (3i to 3i boiling water) for replacing blood fluid, may materially aid reaction. It is probable that *hot immersion baths*, especially in infants, would prove a potent aid to other treatment.

Caution—Take care not to kill the patient by scalding from an ill corked bottle, nor to cruelly blister the body with mustard, nor overdo the turpentine applications, for fear of kidney congestion and strangury. Remember the skin is very insensitive, so that no complaint may be uttered. And give him plenty of fresh air, warm, if necessary, but not charcoal-heated, which may cause death from CO and CO₂.

VI THE STAGE OF REACTION—Under the above treatment six hours should make a marked improvement. But do not relax efforts until reaction is thoroughly established, and even then continue the strychnine at longer intervals (say 6 to 12 hours) until all danger is passed. Remember excessive reaction—reactionary fever ensues in all European cases or in natives with European meat eating habits, as babus, Gurkhas, certain Mahomedans, &c. but not as a rule in ordinary vegetable natives. Hence its prevention or moderation must be kept in mind. A curious thing is that it resembles in some cases *enteric fever*, and I invite study of this. *Continue intestinal antiseptics till convalescence*. Acute offers satisfactory means of reducing temperature. The bilious nature of the motions, now fecal and semi-solid, must be cautiously maintained with calomel and mag sulph.

With collapse, of course, the urine has ceased to be secreted—the organs engaged with the ejecta and sweat having usurped the functions of the kidneys. It may take a couple of days after reaction to establish them, while fever, as is usual, may further delay them, as may also previous treatment opium, morphine, atropine, etc., all arrest secretion. It is therefore a mistake to worry the kidneys by too early attempts at forcing action. At the same time *urination occurring is an important sign of safety*, implying the permanent establishment of reaction and the recovering of the kidneys from congestive nephritis. If, by the second day of reaction no urine passes even unconsciously, or accumulates in the bladder, try counter-stimulation of the loins. If there is urgent danger of uremia, pilocarpine gr $\frac{1}{10}$ may be injected, but it is a risky drug, and, if the heart is weak, should be guarded by gr $\frac{1}{10}$ or $\frac{1}{16}$ strychnine. But ordinarily, if the aconite and diaphoretics do not overcome the difficulty, try *hot coffee*, or Kola, or even tea. Then, *caffeine alkaloid* gr 1, every half hour until effect, with or without digitalin. Please note that atropine, strychnine, brucine and caffeine (tea and coffee) unlike ether, chloroform, morphine, alcohol and chloral, all *raise the body temperature*. (See Schafer's *Text Book of Advanced Physiology*, Vol I, p 821).

As for *diet*, a small quantity of very bland and nutritious food, repeated every two to three hours, is to be cautiously tried as soon as the reaction is well assured. Brand's essences, Valentine's meat juices, bovrine, hæmatogen, or raw egg along with arrowroot prepared in water, and predigested or not with pancreatine or maltine, and zymised milk, suggest the safest nourishment. Next day these may be followed up with Benger's predigested food in milk, or Nestle's and Mellin's foods &c. *Sanatogen*, containing the glycerophosphates of sodium, *Somatose*, 'the most highly concentrated food known,' and *Plasmon*, milk albumen in digestible form may prove exceedingly useful. All three have been highly enlisted in similar cases, as powerful restoratives. Ring the further changes on porridge of rice, sago, hominy, "grape-nuts," "force," "frame food," &c. The return to solid food

should be gradual, not before a week to a fortnight after convalescence (i.e., return of temperature to normal). **Caution**—Have little to do with beefsteaks (including Liebig's Extract, Lencoe, bovril, and the like), or broths, and soups—the sham "nourishments" of our grand mothers and of ancient physicians they are a delusion and a snare. Dr. Fothergill, years ago, denounced them as being unavailing for more deaths than all the wars of Napoleon; and yet we hear of them still pervading our sick dietary, taking equal rank with that other horrid impostor, brandy. It must be repeated that *these are only mild stimulants and appetisers*, and not food in any practical sense—the real food is cast out in the rejected meat.

ENDOTHELIOMA OF THE PAROTID GLAND

BY F. PERCIVAL MACRIE, F.R.C.S., I.M.S.

THE patient, a Hindu male, aged 18 years, presented himself on November 28th, 1904, for treatment of a large tumour in the neck. The history was that five years ago he was lifted up by the ears, and after that a nodule appeared on the left side of the neck just below the lobe of the ear. Since then it had gradually increased in size, and now on account of the deformity it caused (on which account he was unable to get married) he wished it removed by operation.

On examination there appeared a large tumour on the left side of the neck overlying the angle of the jaw and pushing the whole ear upwards and backward so that it appeared as if the ear was riding on the top of the tumour.

In a direction from below upwards and backwards the growth measured $7\frac{1}{4}$ inches, and at every level it felt as a large mass between the fingers. On palpation two parts were noticed, divided by a slight constriction.

The upper part was fairly free and consisted of several rounded masses of cartilagenous hardness, and these knobs were apparent under the skin when the tumour was viewed in profile. The lower half feels uniformly smooth and firm but not hard. This part dipped down on to the neck seemed to have deep connections.

The skin was reddened and somewhat tied down at certain places, but apparently only as the result of the application of native remedies.

The growth extended from an inch below the upper level at the thyroid cartilage, forwards covering the angle of the jaw and upwards for one and a half inches above and behind the external auditory meatus.

The sterno-mastoid muscle lay over the tumour below, but could not be traced higher up.

The tumour was painless, non-inflammatory, did not move on deglutition, and formed no projection into the mouth or pharynx.

The blood was examined and found as follows—

Red blood corpuscles	3933000 per c m.
White "	3750 " "
Hæmaglobin	112 p c "
Individual corpuscular richness	14
Polymorphonuclear leucocytes	42 p c
Small mononuclear "	42 p c
Large "	13 p c
Eosinophile "	3 p c

Blood paletts unusually numerous It was noted that the blood oozed very freely from the ear-prick which suggested deficiency in coagulation power On this account five thirty-grain doses of calcium chloride were given during the two days preceeding the operation *

Operation — A five-inch incision was made in the line of the sterno-mastoid and that muscle held back

The external jugular vein crossed the tumour, and was divided between forceps

The common carotid artery was exposed and preparations made for its temporary ligature, a proceeding, however, which turned out to be unnecessary

The tumour was dissected out *en masse* chiefly from behind and above

It lay in close connection with the great vessels of the neck from which it had to be separated with a blunt dissector No connection, however, was traced between it and the intercarotid body Above it had deeper attachment and lay almost in contact with the styloid process The facial nerve wound around its upper pole and in the fascia covering it broke up into the pes anserina Very fortunately this fascia could be stripped off the tumour and so the branches of the facial nerve were left quite intact Beyond the temporary flooding of the wound with blood due to the division of a small vein at its point of emptying into the internal jugular the hæmorrhage was almost nil The immediate cessation of all capillary bleeding was a most satisfactory feature

A drainage tube was inserted, the skin sutured with silk and sponge pressure applied

Beyond a little local swelling of the wound and tenderness the first few days, the subsequent course was uneventful Stitches were removed on the 9th day, and he returned to his village on the 10th At the second blood examination made on the 9th day the leucocyte count had risen to 8125 per c m (a differential count was made, but the notes were mislaid)

The tumour was seven inches long and weighed 11 ounces and 2 drams

It was firm, smooth and rounded below and hard and lobulated above

The superficial cervical fascia was adherent to it in front where native cauteries had been applied, but elsewhere the tumour was free There was no distinct capsule On section it appeared a polymorphic tumour The main bulk consisted of a soft myxomatous fabric intersected irregularly with fibrous areas, some being so hard as to creak under the knife and

present the homogenous appearance of hyaline cartilage There were reddish brown soft areas and some glairy mucinous fluid which was not enclosed in cysts

The upper lobulated portion consisted mainly of hyaline-like tissue, but in the lower and softer part a great variety of tissues appeared mixed, thus placing beyond doubt (if such had previously existed) that the tumour was that known as 'enchondroma of the parotid' "mixed parotid tumour" or "mixed salivary gland tumour"

Pieces hardened in formalin 4 p.c. were subsequently cut and stained at the Pasteur Institute, Kasauli, by the kind permission of the Director

If the old opinion as to the nature of these tumours still held, the microscopic examination of this specimen would have no interest, but for several years pathologists have been exercised in their minds as to the real nature of these tumours, and there is practically no doubt that they are of endothelial origin and have no right to be called adenomata or myxo-fibro-adenochondroma or any other of the names the very multiplicity of which shewed the doubt that existed as to their true nature This being so no apology is needed for giving a somewhat detailed description of the structure presented and afterwards for giving a short statement as to the reasons why these tumours have been taken from their former category and placed in that of the very interesting tumours known as endotheliomata, peritheliomata blastomata, etc

The following appearances were noted —

The tumour consists of two parts—

(1) The stroma

(2) The parenchyma

(1) In the first place there was not that sharp distinction between those elements, which exists in most simple tumours The stroma was finely fibrillated in most parts, granular in others, and again in certain areas was almost homogeneous In these last-named areas the hæmatoxylin stained the tissues a lighter blue and the appearance was that of hyaline cartilage All elements of similar character to those of the parenchyma itself were scattered throughout the stroma

(2) The parenchyma consisted of small uniform cells arranged in columns branching and dividing and in masses A plexiform pattern resulted where the cell elements were scanty, but in the softer parts of the growth all pattern was lost and the cells were massed apparently without definite arrangement The cells where they formed columns often enclosed spaces lined with a single layer of flattened endothelium, and in the lumen some homogeneous material taking a faint colour with eosin was seen

* [I think this simple expedient may be useful where big operations are to be performed and in the absence of the more exact methods of determining coagulation power The blood from the prick of a medium sized surgical needle ordinarily ceases to drip from the lobule of the ear in under half a minute I have seen cases, particularly those suffering from severe anemia or jaundice where the blood continued to ooze for several minutes Such cases would be likely to exhibit very free capillary oozing during an operation and require the administration of calcium chloride beforehand]

In many places strands of cells in rows of two enclosing a narrow unlined cleft extended into the stroma.

In one place a large central endothelial-lined space is seen giving off branches in various directions. This is depicted in Fig 2, and is the most characteristic part seen anywhere.

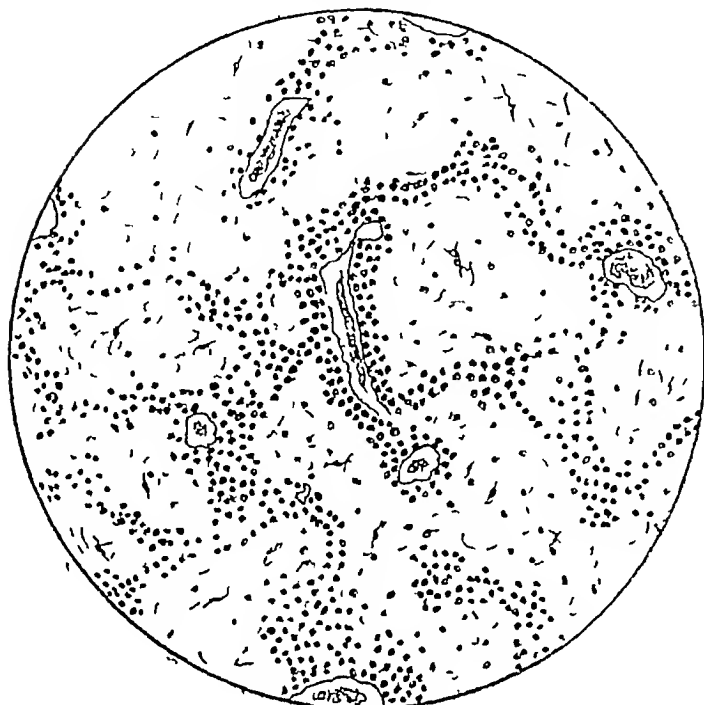


FIG 1

× 60 Shows the columns of cells branching and anastomosing. In the middle is an endothelium lined space containing a little structureless debris. On the right are various small columns two cells deep hollowed out to form channels as in developing vascular tissue. Hollow channels are seen cut transversely in several places. The stroma is finely granular, fibrillated and embedded in it are a few myxoma cells.

The cell elements merge into the stroma, and are not sharply demarcated or shrunken away from the supporting tissues.

The stroma is seen to be finely fibrillated and to have here and there a few irregular myxoma-like cells embedded in it. The cartilaginous-looking areas present no enclosed cells as in hyaline cartilage proper, but are composed of very finely fibrillated groundwork which stains homogeneously so as to make it look at first sight like cartilage. It probably is the result of coagulation of a myxomatous tissue fluid.

The cells themselves are indefinite in shape, sometimes spheroidal, but generally rounded and possessing a nucleus which stains well. They are scattered indefinitely about the section, but are more characteristically gathered together into columns and anastomosing branches. These columns may be four or eight cells deep, but in many parts small strands composed of two cells deep only are seen. When cut favourably by the microtome, these cells enclose a canal lined by a fine basement membrane of endothelial cells and some homogeneous material occupies the space. No amount of scrutiny could discover in this mass any trace of blood cells.

In the area depicted in Fig 2, a hollow trunk of cells is seen cut transversely, and giving off in all directions branches which also seen for the most part hollow and lined with endothelium.

It should be noted that no evidence of elastic tissue or of muscular or fibrous coats is visible in this tube, the two latter of which at any rate

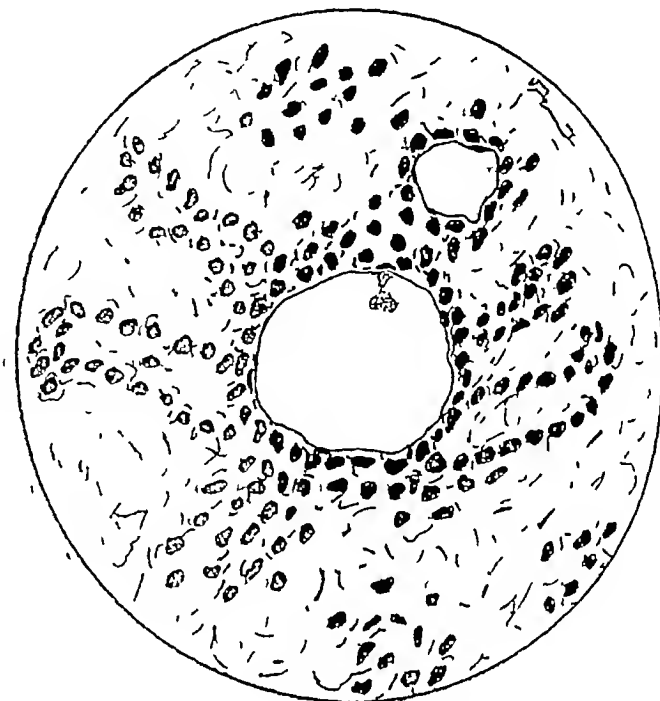


FIG 2

× 420 Shows one large cavity lined by endothelium and surrounded by aggregated stroma cells. Notice the absence of muscular or fibrous layer as present in a fully developed vessel. From the main channel subsidiary ones are diverging and cut in various places. The stroma is very finely fibrillated more so than here represented, and appeared quite destitute of nuclei.

would certainly be present were it a normal artery or vein.

Remarks—Before proceeding to discuss the pathology of these tumours, a few words on the more important clinical characters may not be out of place.

They are generally of slow growth, but are said to sometimes take on a rapid growth independently of any malignant change. It stands to reason that the larger they become, the more difficult is their subsequent removal, for they are very apt to form deep and dangerous connections.

In this case it was open to question, I think many would have condemned operation, and indeed at the time the tumour was found to have entered into close relation with most of the important structure in its neighbourhood. In the early stages the growth is always free and non-adherent, but I see that Rose and Carless (1900 Ed) say "that subsequently the mass becomes fixed and adherent."

The most important clinical feature is the involvement or otherwise of the facial nerve. Starting as the disease does (generally) in close connection with the parotid gland, it is obvious that its relation to the facial nerve must be an

intimate one Mr Butlin's dictum is of the greatest importance. Involvement of the facial nerve always means malignancy.

And malignancy in a growth of any size in this locality precludes operation. Tumours having these characters are found anywhere in this area, e.g., in the other salivary glands on the cheek, lower down in the neck, and in connection with the lips or palate.

Mr Jonathan Hutchinson once described from its physical characters what he called a 'potato tumour'. This occurs in the neck and is of complex structure, and if I remember rightly always malignant. It was supposed to arise in connection with an obliterated branchial cleft.

I saw one such case with him at the Polyclinic, it was removed and turned out to be an endothelioma. It recurred in a very few months, and the man died. These parotid growths were always believed to arise in connection with Meckel's cartilage, but this view now appears less likely.

In this connection it is interesting to note the not uninfrequent appearance of so-called mixed enchondiomata in the testicle. The structure of these was said to be similar to that of the parotid tumours under consideration. If this is so, it would be interesting to know if they too now are proved to be endotheliomata, I have seen no reference to this, but the close physiological sympathy which exists between these two organs adds an additional interest to the subject. I will now add a short note as to the reasons which have been adduced for calling these tumours endotheliomata, and how they may be distinguished from other tumours which are not.*

The stroma presents no diagnostic features, it is composed of embryonic connective tissue and its derivatives, myxomatous, fibrous or cartilagenous formation.

It seems that in most cases the hyaline cartilage so called is not rightly named. In the cases recorded in the above Transactions the undoubted existence of this tissue was not proved. In almost every case some areas presented a suggestive appearance, but on careful examination the absence of the well known cartilage cells was shown, and the matrix as in my case was formed of finely fibrillated or granular tissue staining like hyaline tissue. In some cases, however, probably true cartilage is formed, and certainly there is no reason why this should not be so.

With regard to the essential cell elements, the following points are in favour of the endothelial origin of the tumours. The shape and size of the cells do not serve to guide one as to their origin, their mode of distribution in the tissues is, however, very suggestive.

The same cells which are scattered through the stroma are themselves heaped up in parts to form

the anastomosing columns forming the parenchyma.

This strongly indicates the connective tissue origin of the parenchyma, and is therefore against an adenomatous or epitheliomatous origin.

If these tumours were epithelial in origin, then this peculiarity of cell arrangement would indicate malignancy.

Even then however, the two processes would not be identical because in malignant growths cells wander away from the parenchymatous masses and invade the stroma, whilst the connective tissue cells are merely aggregated in certain places to form columns of cells, a process which does not constitute invasion.

Then, again, in adenomatous growths the cells are lying on a definite supporting basement membrane, and are generally shrunken away from the stroma and appear to be free in the lumen.

In these tumours there is no such appearance, because there is no detachable living membrane to the lumina, the walls of which are formed directly by the stroma of the body of the tumour.

These columns of hollowed tubes of cells lined with endothelial cells can only be embryonic attempts at the formation of lymph or blood channels.

If this process became complete and proper lymph and blood-vessels were formed, then the result would be a lymphangioma or a naevus, but in these tumours development does not proceed to that extent, but there is simple overgrowth of endothelial elements attempting to carry out their ultimate development into hollowed-out vessels. Some sections shew a distinct naevoid arrangement, but there is no evidence of muscular or fibrous strata such as go to form the structure of a perfect artery or vein.

In some of these tumours the spaces enclose ill-developed or degenerate blood-cells, but in my case no such evidence was obtained, and the probability is therefore that in the particular case the tumour arose from lymphatic endothelium.

Messrs Raymond, Johnson and T W P Lawrence (p 327, *ibid*) say —

"We agree with those pathologists who regard the tumours under consideration as endotheliomata. Our reasons for this conclusion are that the cells are arranged in definite strands, in parts often tubular, and in their general arrangement imitate an embryonic vascular formation which may be regarded as the type upon which the structure of the tumour is based."

Again, "we may incidentally remark that, on histological grounds, the question of these tumours being typical adenomata can scarcely be seriously discussed, for the structure is so essentially atypical that if of epithelial origin it could only be carcinomatous."

These two writers whilst questioning the probable origin of these tumours point out the existence of the inter-carotid body in this neighbourhood.

* [For these remarks I am chiefly indebted to Vol LIV of the Transactions of the Pathological Society of London, the only work in my possession which at all bears on the subject.]

In the few cases of tumours arising in this little body the structure closely resembled the so-called parotid gland growths, and they add "from this it is evident that there is in the neck at least one recognised anatomical structure capable of giving rise to tumours apparently identical in structure with those under consideration, and we venture to suggest that there may be in other parts of the distribution of the carotid arteries similar but hitherto unrecognised vascular formations from which the tumours in question arise"

This to me seems feasible because if unobliterated or partially obliterated branchial clefts and imperfect closure of natural lines of union may result in dermoids and other inclusion tumours, why should not obliteration, withdrawal or suppression of the branchial arteries leave remnants which have the potentiality at any time of forming embryonic vascular tumours? If this is so, then not only are parotid enchondromata, not enchondiomata, but they perhaps are not even connected with the parotid gland Drs Edied Corner and S G Scott, (p 345, *ibid*), after the careful study of two cases of this variety of tumour removed from the lip and submaxillary salivary gland, respectively, come to the conclusion that they originated on the endothelium of blood-vessels on the following grounds —

- (1) The structure of the walls of the space in the parenchyma and the variation of their lining cells
- (2) The relations of the lining cells to those of the parenchyma
- (3) The presence of blood in these spaces indicate their function and forbid their being epithelial in origin
- (4) The absence of properly formed vessels in the parenchyma of these tumours of long clinical history and their extreme rarity in the supporting tissue

Drs Rolleston and Grunbaum (p 349, *ibid*) on the examination of three similar tumours from the cheeks and one from the lip come to practically similar conclusion, and speaking of "the alveolar spaces lined by endothelial cells containing homogeneous non-staining material, say that these probably arise in two ways —

- (1) From accumulation of endothelial cell secretion and degeneration
- (2) By the endothelial cells growing around masses of connective tissue cutting off the nutritive supply and causing complete disintegration and degeneration

Enough has been said to shew that good grounds exist for regarding these tumours as endothelial in origin *

[* I have been led to understand that these tumours at any rate in some parts of India are not rare. I may add that I should be very obliged to any one who would send me pieces of such tumours either preserved in formalin 4 per cent. or better still in the form of prepared sections.]

TRICHIASIS, ENTROPION AND TINEA TARSI

By HENRY SMITH, M.D., M.Ch.

MAJOR, I.M.S.,

Civil Surgeon, Jullundur, Punjab

THE terms trichiasis, and entropion, are used in all the text books in a most confusing way, in a way in which I defy any student to define for an examiner, on an actual case, which is which. Each may be either and the student will fare according to the personal equation of the Examiner.

I define trichiasis as a condition in which more or less of the lashes are faulty in their direction, some coming towards the eyeball, and in which the lashes are often erratic in their positions of eruption, with or without incurvation of the lid. The inner ones may point inwards while the outer ones point outwards. In some cases they appear to erupt on no plan or system such as we see in health—unsystematically as the bristles in a bush. This is not a congenital condition. The cause of trichiasis as thus defined is obscure. It is said to follow hordeolum, tinea tarsi and other such conditions, but in my experience it so seldom follows those conditions that I have grave doubts as to their causative influence. Trichiasis proper is chiefly confined to the upper lid.

Entropion, I define as incurvation of the tarsal cartilage including its border. In both entropion and trichiasis the lashes ultimately impinge on the eyeball.

Entropion of the upper lid is caused, I think, almost entirely by the contraction of its under surface following trachoma, assisted by the hypertrophy of the orbicularis muscle which is caused by its continued over action from the conjunctival irritation of trachoma. There is a spastic entropion, seen most commonly in children, due to chronic conjunctival irritation of a severe nature—mostly trachoma and corneal ulceration. In this condition the fibres of the orbicularis muscle seem to act more strongly near the border of the lids and undoubtedly become hypertrophied in that situation. This same action of the orbicularis in adults and more especially in aged people is the cause of entropion of the lower lid in them. According to my definition it is the altered direction of the lashes and the altered system of their eruption which constitutes trichiasis. It is the simple incurvation of the lid which constitutes entropion. It is plain we may have both conditionally combined.

Treatment—The treatment of trichiasis and entropion are pretty much the same apart from spastic entropion. Entropion, and trichiasis if it exists, should be treated before trachoma as they

are both rapidly and certainly curable, whereas trichoma is one of the most obstinate of human affections as far as treatment is concerned. Trichiasis and entropion only call for treatment when the cilia impinge on the eyeball. We now hear little of electrolysis of the hair bulbs compared with what was the fashion 15 years ago. Electrolysis of the hair bulbs and Wilde's operation (the scalping operation) should be put on the same footing. The result of the one looks just as barbarous as that of the other. The result of both is highly disfiguring. Both should be relegated to a place in the history of barbarous operations. When the hair bulbs are electrolysed the whole cilia-bearing portion of the tarsal cartilage, atrophies and the border of the lid thins down to a condition much like the border of the third eyelid of a bird. Neither of the above operations is necessary as the worst case can be satisfactorily dealt with by a plastic operation which does not disfigure the patient. Besides electrolysis is a painful operation and a painfully tedious operation. Snellin's operation is designed to render the curve of the lid normal, as well as to alter the direction of the lashes, by taking a V shaped piece out of the tarsal cartilage, the angle of the V pointing towards the eyeball, and bringing the limbs of the V together by stitches. Do we really thus render the curve of the lid better than it was before? I consider that we do not. We leave a ridge on the interior of the cartilage at the point of the V where there was none before and while we do not otherwise alter the original curve in other respects we add an additional curve. This operation does not sufficiently alter the inclination at both ends of the lid and the patient has not long left hospital when he returns with lashes impinging on the eyeball at both ends. This insufficiency to permanently retain the lashes in position at both ends of the lid is the grave objection to all the standard operations in severe cases—I presume we see more severe cases at our Indian hospitals than are seen in Europe and America where patients sensibly go under treatment much earlier in the history of their malady. In severe cases, the different operations which do not involve the *complete* division of the tarsal cartilage from end to end and the *complete* division across the ends of the cilia bearing strip of cartilage, leaving that strip attached only to muscle and skin and the removal of a small ellipsoidal piece of skin from the outer surface of the lid, and the excising of a portion of the overgrown orbicularis muscle and thus reducing its power, are in my experience imperfect operations and will have to be repeated sooner or later. Scott's operation and the various other operations consisting of partial slitting of the cartilage and depending on the tension of stitched up skin to retain the hair bearing border in position are, in my experience, only trifling with the condition.

The only operation I now do, after a full trial of the multiplicity of operations in vogue, is as follows—I catch the lid (upper lid) close to the border with a Bryant's artery forceps and turn it out. I then insert a Graefe's knife just outside the lachrymal punctum in the intermarginal space, taking care to be rather behind it than to run any risk of cutting the hair bulbs across—no evil result follows cutting across the ends of the meibomian gland ducts—and stick the cartilage clean through from that point to the external commissure. I then turn the edge of the knife forwards at each end and cut the strip of cartilage clean across leaving it attached only to the skin and muscle. I then take off the forceps and insert between the lid and the eyeball a horn spatula and excise an ellipsoidal piece of skin from the lid—the lower incision parallel with the border of the lid and about $\frac{1}{4}$ th of an inch from its margin. From the space thus exposed in the middle I take out a liberal piece of the orbicularis muscle down to the cartilage, so as to reduce its power, and unite the edges of the skin with a few stitches. When I have gone thus far I observe that the ends of the cilia bearing stripe stand out as a pair of unsightly points. These points I trim with a sharp pair of scissors. At this stage, any one can see that I have caused the cilia bearing border to slide up as a whole from end to end on the sliced border of the base of the cartilage. I do not insert a piece of skin or mucous membrane graft in the gap there seems to be no gap as the one is slid upon the top of the other. The after result is about as perfect as any operation is perfect. The piece of skin removed is smaller than is necessary to remove in Ailts' operation. The cilia bearing border I have never seen necrosing. In the case of only a few in-growing hairs I, in the same manner detach the piece of cartilage bearing the hairs at fault and stitch in with a steeple stitch a piece of mucous membrane from the lip running the two tails of the stitch, on separate needles, up through the incision and out through skin about $\frac{1}{4}$ th of an inch above the border and tie them there over a small roll of gauze. This graft always grows if the weeping of blood from the wound has completely ceased before it is inserted. Inventions in the form of forceps to render the slitting easy and to prevent loss of blood are membranes. They prevent the operator from cutting out right to the ends. The loss of an ounce of blood is of no importance.

In entropion of the lower lid—trichiasis of the lower lid is exceedingly rare—the excision of a small ellipsoidal piece of skin from the lower lid and a large piece of the whole thickness of the orbicularis muscle and stitching the skin edges together is all that is necessary. Care must be taken not to excise too much skin as it is better to have to excise a second piece on account of insufficiency than to have to do an ectropion.

operation on account of having done too much—conjunctival irritation has caused the orbicularis muscle to become hypertrophied in the continued effort to shut off light and the hypertrophied muscle in turn causes the entropion, hence the importance of dealing with that muscle in entropion of the lower lid. The methods of controlling entropion by stitches alone are in my experience not satisfactory. In addition to the above operations for entropion, it is often necessary to elongate the palpebral fissure it having from some cause become very short—by cutting the external commissure and uniting the bulbar conjunctiva with three stitches to the skin, one in the angle and one above and below, so as to prevent it reuniting.

A form of entropion, most common in children, is due to the continued blepharo-spasm in the efforts of nature to shut off light from an eye affected with corneal ulceration or conjunctival inflammation of a somewhat lasting character. The consequent irritation induces a hypertrophy of the orbicularis muscle from over action which again induces the entropion of both lids. It is commonly held and, I think correctly, that the fibres become shifted towards the borders of the lids. The treatment of this condition consists in elongating the palpebral fissure and, if it be already long enough, the conjunctiva should not be stitched to the skin, so as to allow it to resume its original length. It is also advisable at the same time to slip a Graefe's knife between the skin and the muscle of both upper and lower lids and with the finger or spatula beneath the lid to cut the orbicularis right across. Snellen's stitches can then be applied if seen necessary. The conjunctival or corneal condition or both must be treated at the same time.

Tinea Tarsi, whether this condition be parasitic or not the result of treatment with the usual ointments is very unsatisfactory. I have seen cases go on for years under treatment by repeated epilation—clearing off the scabs with soda solution daily and daily application of yellow oxide of mercury 8 grains to the ounce without the slightest improvement. I have used it as much as 50 grains to the ounce without inconvenience to the patient and no apparent benefit. With such ointments it is a most obstinate condition to cure. I, now when the case comes before me, clear off the scabs and as soon as weeping from the raw surface has ceased I slightly turn out the margins of the lids keeping the eye closed at the same time, and rub the margins heavily with a solid nitrate of silver stick. In a few days the nitrate of silver slough is ready to drop off and with it most of the lashes. The remainder I extract and repeat the nitrate of silver stick application a second time and a third time similarly. I find that this is generally sufficient to completely cure the malady. In my experience it is incomparably the most rapid and the most certain of all the remedies so far used for this purpose.

A Mirror of Hospital Practice

MULTIPLE KELOID, THE RESULT OF SMALL POX

By C. J. FEARNSIDE,

MAJOR, I.M.S.

Medical Superintendent, Central Jail, Vellore.

THIS convict was admitted into the Central Jail of Vellore a few months ago. He states that three years ago he had a severe attack of small-pox and that he was confined to bed for several months. The pustules appear to have coalesced and formed irregular raised ulcers which on cicatrization became keloid. The native physicians in the first instance covered his body with plantain leaves smeared with



gingelly oil, but during the later stages his body was swathed in poultices of mafosa leaves while turmeric powder was administered finally to heal the ulcers.

He seemed quite satisfied with the treatment, which he said was that usually adopted by the hakeems of his village. He further remarked that others attacked by small-pox had not the raised scars on their bodies which he had, so that the keloid growths are not the result of the treatment. The whole of his body, with the exception of his scalp and face, is disfigured and covered over with keloid tumours. On the back some of the tumours are as large as small oranges attached to the back by fairly thick pedicles. These will be seen in the accompanying photograph. The tumours cause him considerable pain if squeezed. On the hips the scars are not so raised and tend to run in to one another. On the thighs and legs they are round and corded and in places the limb is encased in a shield of cicatricial tissue.

It is seldom that one meets with such an extreme case of keloid and it is in a way unique and worthy of record.

TUMOUR OF THE BRAIN PROBABLY SARCOMA

By J J ROBB, M B,

CAPTAIN, I.M.S.,

District Medical Officer, Tinnevely

KOILPILLAI, a male (Shanai Christian and a cooly), æt, 30 years, was admitted into the Municipal Hospital, Palamcottah under my care for a tumour of the brain on 26th May 1905.

History—The patient says that about eleven months ago a small swelling appeared just above the occipital protuberance which gradually became increased in size.

He gives no history of any injury, alcohol, syphilis or mental troubles. He had no convulsions, no paralysis. Says he had vomiting

the back. He has had headache from the very commencement. It has been intense and persistent. Says he had a sort of burning sensation in both eyes. Vision in the left eye was becoming defective.

Present condition—There is a large irregular swelling on left side of head involving a portion of the left half of the frontal bone, the whole of the left parietal bone (pressing down the left ear) the squamous portion of the temporal bone and the major portion of the left side of the occipital bone. The swelling points generally backwards and outwards towards the left side of the head. All the bones on this side are separated from each other and the veins are distinctly seen in the fissures between the bones. On the right side of this swelling at the junction of the occipital with the right parietal there is another swelling which fluctuates. It is globular, is pinkish and is about the size of an orange. The swelling is pushed out through the bones pointing backwards and slightly outwards and downwards towards the right side of the head.

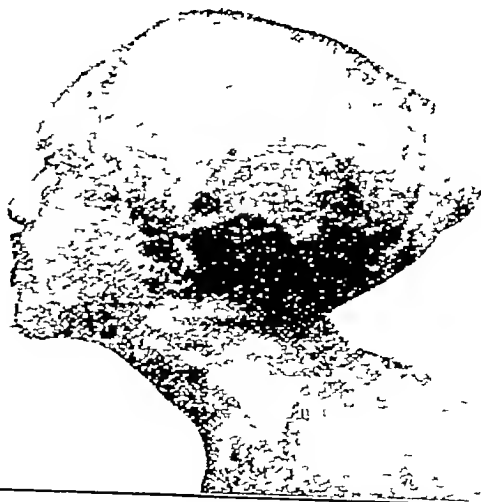
All these details can best be seen by the accompanying photographs.

Measurements—

The circumference of swelling on left side (i.e.) round the neck of the tumour measures	26"
The vertical diameter	12½"
" transverse "	14½"
" circumference of the small swelling measures	10½"
" vertical diameter measures	4½"
" transverse "	4½"

The left side of head is quite painful on pressure.

Symptoms—He complains of headache which is very intense. He feels uncomfortable and complains of heaviness of the head owing to the weight of the tumour. He gets little or no sleep. He talks perfectly sensibly. He is not



when the tumour was about five months old. This lasted for nearly four months. This vomiting came on immediately after food.

Another small swelling appeared just about four months ago on the right side of head at

forgetful, can keep his attention fixed on any one subject for any length of time. Is prompt in answering questions. Has no convulsions of any description, no vomiting and no aphasia. Hearing not quite normal, the left ear being

worse than the right Reflexes normal Patient moves about quite easily Bowels regular Circulatory system—heart normal but the pulse is quick

His temperature on admission	100.4 F°
Pulse	119
Respiration	22
All the other organs normal	
Weight	107
Urine specific gravity	1006
Reaction	Acid
Sugar	Nil
Albumen	Nil

Progress of the case—A reference to the enclosed table will give a clear idea as to the weight, pulse, etc

Treatment—Disease too far advanced for any surgical interference

Internally—Bismide and morphia Diet—milk, bread, mutton, curry and rice

The patient has been discharged on 2nd August 1905 at his own request

Remarks—With the history of a tumour growing so rapidly it is evidently malignant and being primary probably sarcomatous in nature I however doubt the accuracy of the history as the tumour is so large What strikes one is the paucity of the symptoms one would expect to get We have constant headache and optic neuritis, but the history of vomiting is very vague Then we have no epileptic symptoms as one would expect, as although the tumour is growing outwards severing the bones apart, yet in order to do so it must press on the brain and so we would have expected to get some epileptic symptoms Also one is struck with the pulse as in intercrural pressure one expects the pulse to be low and not increased as in this case Also the weight is worthy of notice, as it varied somewhat and increased for some time after the patient's admission But the intense headache and the weight of his head, the patient seemed fairly comfortable his appetite was good and otherwise his condition was very fair I greatly regret my inability to get him to stay in hospital as I do not think he could have lived very much longer and the *post-mortem* examination would have been very interesting

I have to thank Hospital Assistant J Masilamani Pillai for taking notes for me in this case

A CASE OF GUNSHOT WOUND OF THE BLADDER WITH PECULIAR SEQUELS

By G H LEE ABBOTT, M B (LOND.),

CAPTAIN, I M S

WHILST I was in charge of the Charitable Hospital, Chakdara, N-W. Frontier Province, a Pathan came to the Hospital on the evening of the 28th January, 1904, saying that he was passing a calculus down his urethra

In my absence, Hospital Assistant Mahammad Fayyaz Khan removed two pieces of necrosed bone from the meatus urethrae each the size of a two anna piece

On enquiring into the history of the case it appeared that the patient had been shot some ten months previously, the bullet entering in the left groin one inch outside and slightly above the left spine of the pubes and taking exit behind the right great trochanter, leaving a large and irregular wound

No great discomfort was entailed by this, and in consequence the man remained in his village and was treated in the ordinary Pathan manner, i.e., applications of fresh chicken skins over the wounds

However, three weeks after this visit to Hospital on the 28th of January, he came again complaining that he was rapidly becoming weak through large losses of blood in his urine A specimen showed that very large quantities were being passed

The first thought that crossed my mind was that there were more pieces of necrosed bone in the bladder, but on passing a small sound, which entered the neck of the bladder with some difficulty, a stone of some considerable size was immediately detected

Taking all points of the case into consideration I decided to perform a lateral lithotomy at once in preference to any other operation

A stone, as long and as thick as a little finger, was rapidly and easily evacuated

On exploring the bladder with the finger no other abnormality was found beyond indications that the posterior surface of the body of the pubes had been the part originally affected

The stone (mates) was somewhat remarkable, in that it was very friable indeed, and had a nucleus of a long piece of cloth, which had undoubtedly been wrapped round the bullet to act as a wad and which had been left in the bladder during the passage of the bullet



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A CASE OF BLADDER

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Indian Medical Gazette.

NOVEMBER, 1905

THE NEW PAY RULES FOR THE JAIL DEPARTMENT

THERE is one aspect of the Viceroyalty of Lord Curzon which has escaped the writers who have dealt so freely with other sides of His Excellency's many activities, and this is that the great and important question of the pay of many of the services has been taken up, and the rates have been brought more into line with modern conditions of supply and demand, and more in accordance with the great increase of work which has occurred in all departments of Government service in India. The pay of the Army, the Police, the Opium, the Public Works, and the Medical Departments have been overhauled and improved, and even the Civil Service has received a substantial boon in the much needed revision of its retiring allowances.

It will be remembered that when in March last the long-looked-for revision of the pay of the Civil side of the Indian Medical Service was announced, there was considerable consternation and not a little indignation when the question of the pay of Jail Superintendents was omitted from the Government Resolution and the more so, as it had become known that the proposals made by the Secretary of State would, if acted upon, have had the quaint result of generally reducing rather than improving the pay of officers in this department.

The Government of India, however, saw this at once, and promptly referred the question to the India Office for reconsideration, and now, after no great delay, the rates to be given to I M S Officers of the Jail Department are announced.

Will they give satisfaction, will they induce men to join the department? We may say at once that in our opinion they are on the whole satisfactory, and though by no means so good as we hoped for, they are infinitely superior to the very meagre rates in force up to this time.

Let us first note what the old rates for Medical Officers joining the Jail Department were. For the combined executive and medical charge of a first-class Central Jail, a Commissioned Medical Officer received Rs 700 a month, rising by annual increments of Rs 50 to Rs 950, and after

18 years' service in the department the pay rose to Rs 1,200. A more illogical and absurd way of fixing a progressive rate of pay has never been imagined and practically speaking no one has ever reached the Rs 1,200 grade under the old rules.

Now this contrasts very badly with the new rates, which begin with the (nominal) rate of Rs 650 and go up to Rs 1,550.

There can be no doubt, therefore, that the new rates are infinitely superior to the old, but they are not as good as what were hoped for. It was thought by many interested that the rate would go up progressively from Rs 700 to Rs 1,400, and that the rate of pay would be governed (as previously) by length of service in the department and not by reference to the military rank of the officer concerned. To show the difference between the hoped-for rate and that actually granted—let us suppose the case of a Captain who gets a *pucca* appointment in the Jail Department on the day he completes four years' service, under the hoped-for rules he would be getting Rs 800 in his seventh year of service, during his eleventh year of service Rs 1,000, and on attaining his majority, after twelve years' service, he would be getting Rs 1,100, that is a definite increase in pay of Rs 50 per month each year, and the total pay received during that period would have been considerably more under the hoped-for rules.

On the other hand, we have no right perhaps to think of the hoped-for rules at all, at the most they were suggestions and proposals. When, therefore, we contrast the new rules with the old, we see the manifest advantages of the new rates, though this increase is not so manifest as it might be at the beginning of a man's service. Let us take the following case: a young officer joins the Jail Department at the commencement of his fourth year, we may suppose he officiates as Superintendent of a 1st Class Central Jail for that year on Rs 550 a month, next year just as he begins his fifth year he gets his appointment "*pucca*." Now let us contrast the old rates with the new. From the commencement of his fourth year till he attains his majority after twelve years under the old rules he would have drawn a total sum of Rs 88,800, under the new rules he will draw a sum total of only Rs 82,200, so he is now Rs 6,600 on the wrong side. By the end of his twentieth year, when he becomes a Lieutenant-Colonel, this wrong will be largely righted, and during these eight years he will draw Rs 6,000 more under the new than under the old rules. In the next five years under the new rules he

will draw Rs 15,000 more pay than under the old, so that at end of 25 years he will have drawn a net total of Rs 14,400 more pay than he would under the present rules. Suppose now he remains on as a Jail Superintendent and does not get the chance of promotion to the Head of the Department, but gets put on the selected list of Lieutenant-Colonels at the commencement of his 28th year, he will under the new rules draw during these five years Rs 18,600 more than he would under the old and so will end up his career in India, and in the Jail Department with a credit of Rs 33,000 in pay drawn in excess of that he would have drawn under the old rules.

This, therefore, is a distinct advantage, and though from a recruiting point of view we would have preferred to have the advantages of the new rates more marked in the first ten years of service, yet it cannot be denied that the increased rates of pay come at a time when a man's expenses are increasing, and the net gain in pay drawn during a man's career is substantial and satisfactory. So far for the improvement in the new pay rates over the old.

The following table compares the pay now proposed for the Jail Department with that given in March last to certain other I. M. S. Officers in Civil employ.

We may remark that the upper line, or pay for Lieutenants, is not of much practical value as the number of Lieutenants in any form of Civil employ, except "plague duty," is small —

by Rs 200 a month, against this we must place the Civil Surgeon's local allowances, if any and his private practice which varies from nothing in many districts to considerable sums in a few. The District Jail allowance of a Civil Surgeon is balanced by the free house given to the Jail Superintendent.

When we compare the jail rates of pay with those given to Superintendents of Central Lunatic Asylums, we are at a loss to understand why for 15 years an Asylum Superintendent should get better pay than a Jail Superintendent. In our opinion the jail rates of pay should have been identical with the rates for the Alienist Department. Compared with the appointments in the Sanitary Department the jail pay is better all round, and the life is a much more pleasant one than that possible for the peripatetic Deputy Sanitary Commissioner. The bacteriological appointments are the best paid of all in the above table, and they combine a life with few transfers and a residence in many cases in the hills.

On the whole, therefore, we are of opinion that the rates of pay now offered in the Jail Department are good, and should be sufficient to attract men to join the department. When we consider that the transfers are much fewer (and nothing is so ruinous to junior men as transfers), and that no house rent is paid and that there is on the whole much less worry than in the life of a Civil Surgeon, we are of opinion that a young officer, especially if married, might well

I M S	Jails ¹	Civil Surgeons ²	Asylums	Sanitary Dept.	Bacteriological Appts	Military ³	
Lieutenants	650	450	650	600	650	500	Usually officiating rates nominal only. These
Captain	700	500	700	650	700	550	
Captain (after 5 years)	750	550	800	700	800	600	
Captain (after 7 years)	800	600	850	750	850	650	
Captain (after 10 years)	850	650	900	800	900	700	
Major	950	750	1,050	900	1,050	800	
Major (after 15 years' total service)	1,050	850	1,150	1,000	1,150	900	
Lieut. Colonel (after 20 years' total service)	1,400	1,150	1,400	1,350	1,500	1,250	
Lieut. Colonel (after 25 years' total service)	1,450	1,350	1,450	1,400	1,500	1,300	
Lieut. Colonel (on selected list)	1,550	1,450	1,550	1,500	1,600	1,400	

¹ 1st Class Central Jails only considered. Second Class Central Jails usually held as collateral charges by Civil Surgeons.

² Second Class up to 15 years' service.

³ The two rates represent that of a first class and of a second class Civil Surgeon.

⁴ 1st Class Civil Surgeon's rates.

⁵ i.e., in permanent charge of an infantry regiment.

In this table the Jail Department rates do not come out badly. Compared with the pay of Civil Surgeons the jail pay is always higher, and for the first 15 years of service it is better ponder over the not few advantages offered by the Jail Department, and the service as a whole is much indebted to the Director-General and the Government of India for having so

successfully modified the views of the Secretary of State, which, when they became known in March last, created considerable disappointment and no little consternation among the officers concerned

TROPICAL LIGHT AND WHITE MEN

IN our September number we gave a brief description of this interesting book by Major Woodruff, M D, of the United States Army, and promised to return to it

It is a book that deserves and rewards careful reading. We cannot touch upon many of the interesting points in it, but there are a few which we cannot let pass

It will be remembered that the burden of Major Woodruff's thesis is that it is light rather than heat that the white races have to dread in the tropics, and that the varying degrees of colour in the human races have been evolved in the course of ages, because by pigmentation the dangerous actinic rays can be excluded, that is the short wave rays of light (the violet, indigo, blue and ultra-violet). Pigment, then, is an armour evolved by natural selection to exclude these harmful short rays, and according to our author, the amount of pigment in an individual is in direct proportion to the intensity of the light of the country to which his ancestors have proved their adjustment, by centuries or millenniums, of survival in health and vigour. Major Woodruff then shows that the Aryans* were blondes, and originated in a cloudy, rainy, misty country, and he lays down the law that "the blondness of a European nation is proportional to the cloudiness of the country"

Major Woodruff's experience is derived from his knowledge of the life of American soldiers in the Philippines, and the description by no means applies altogether to Europeans, *re*, Britishers in India. We may agree with our author as to the marked feeling of well-being and feeling of stimulation, which accompanies the first few months of tropical residence of a young

white man, but there soon follows some degree of tropical exhaustion. This leads Major Woodruff to the statement that a "little alcohol is needed to aid digestion and to supply extra absorbable, digested and easily-burned fuel, and thus to relieve the natural processes of part of their burden." Against this view we altogether protest. We do not admit that a little alcohol is *necessary*, though we agree that a moderate amount does no harm, and is pleasant

There may be something different between the stolid Britisher and the excitable American, for we do not recognise the portrait painted by Major Woodruff. We do not see in India so much of the neurasthenia which, our author tells us, is "universal" among white men in the Philippines, nor can we agree with the statement that "everyone who lives in the tropics over one year is more or less neurasthenic", nor can we agree that because highly-spiced curries are (or rather were) the delight of the old-time Anglo-Indian that this points to a necessary feebleness of digestion "in all whites who go to the tropics". Feebleness of digestion is common enough in India, but surely it is extremely common in England and especially in America also

Let us see, however, the basis for Major Woodruff's conclusion that "alcohol in moderation is necessary." He refers us for full details to a paper of his in the *New York Medical Record* (December 17th, 1904), but in his book he gives the statistics of some 2,800 soldiers, in the Philippines, we presume. These statistics are taken to show that the damage done by the small amount of excessive drinking is not so great as the damage done by the climate to the total abstainers. Approximately 11 per cent of abstainers died, while only 3 per cent of the moderate and less than 2 per cent of the excessive drinkers died. Again, 15 per cent of abstainers were invalided home, about 10 per cent of moderate drinkers, and only 8 per cent of excessive drinkers. This may be correct for these individual 2,800 men, but surely if these figures are to be made the basis of a plea for moderate drinking, why not go further to fare better, and recommend excessive drinking?

Among the other results of insufficient pigmentation, our author puts down amnesia, he writes thus—

"The loss of memory from which almost everyone suffers in the Philippines is more marked the older the person and the more neurasthenic.

* In thus giving a Northern European home to the so called "Aryans," Major Woodruff follows the best modern authorities on this vexed question, *eg* Schrader. In spite of the popularity of Max Müller's wild opinions on the Aryan question, it is now recognised by scholars that "the influence of climate (light, says Major Woodruff) has exterminated the Aryan race in India, Persia, Greece, Spain, France—the Aryan speech alone being left as permanent evidence of early Aryan conquest."—(Taylor). Language is mutable, race is persistent, and identity of speech does not imply identity of race,—an obvious fact, but owing to Max Müller's misleading eloquence, the contrary opinion still holds as a popular view of the Aryan question.

he has become. It exists in every grade from mere forgetfulness to complete loss of memory of current events, loss of sense of value, &c." He compares this with what in India we call the "Punjab or Burma Head," which is doubtless common enough in men, who have been hard-worked for long periods, it may be in lonely stations, without much social life or distraction.

Other tropical nemoses are skin diseases, which, according to our author, are common in blondes in the tropics, and he also makes the astounding statement that "the naked coolie works in the sun and has a clean soft skin, which is remarkably free from disease." So far is this from being the fact in India, that the number of cases of skin disease in our charitable hospitals and dispensaries are in excess of any other kind of disease.

Granting, then, the evil effect of tropical light upon the fair-skinned blonde European, let us now turn to the chapter in which Major Woodruff lays down his "rules for white men in the tropics."

We have, in our former article, agreed that acclimatization is impossible if a white man goes far from his zone. The past experience of white troops in the tropics has been very disastrous, but in the last fifty years sanitarians have discovered the causes and formulated rules for the avoidance of the evils. The death-rate of British troops in India, for example, has been reduced from 60 per mille to about sixteen. "Nevertheless" (says our author) "there is more or less destruction of health even when we do manage to dodge the infections."

Since, then, these neuasthenic states are due to excessive metabolism caused by light, we may, by avoidance, escape some of the ill-results of physical unfitness, though we cannot hope to colonise the tropics.

The first point noted by our author is that our "day clothing should be opaque," the colour does not matter, provided it does not transmit the shorter light waves and the ultra-violet. The outer clothing should be such as to reflect heat, and as certain experiments have shown that heat is absorbed by colours in the following order—black, pink, yellow, gray and white, it follows that our outer clothing should be white, gray or yellow (perhaps khaki would do). Here again, however, we meet with a difficulty, for, if white clothing reflects heat, it also freely transmits the light waves. Therefore, our underclothing should be opaque, black would

be the best colour, but yellow or a dark brown will do. In this clothing we imitate animals with white hair and black skin, or our native fellow-subjects with their fine white clothes and well-pigmented skin underneath. For evening or office wear (when in the shade) dark clothes are the best, and in this respect fashion, which has decreed the wear of black evening clothes, has a scientific basis for its fancy.

As for head-gear it must be opaque, and the bigger and thicker, the better. The now fashionable helmet for soldiers, though its shape is better than the older shape of helmet, yet seems to us to be far too thin. It is very undesirable that any military love of so-called 'smartness' should give the soldier a thin and insufficiently protective hat. If pith will not do (and why it will not do, we fail to see), then use a thin hat, but let it be lined with tinfoil, which is certainly opaque to the light rays of the sun. Major Woodruff also pleads for the use of the umbrella by soldiers in uniform, and we see no reason why they should not be permitted to use them, though the very idea will excite ridicule from the military martinet. Our author has much to say in favour of our darkened Indian bungalows, glare must be kept out, as we all have learnt. We agree with him in his protest against the use of whitewash for houses. It is horrible to the eyes in a bright sunshine, greens, dark yellow, and browns are much more grateful. Major Woodruff also pleads for the midday siesta. If the brunette Spinnard has found it necessary in the tropics, it is still more necessary for the blonde Englishman. Many of our readers will be startled when they read—"It is nonsense to expect more than 4½ hours of good brain work daily from white men in the tropics." This will read strangely to the office man in our presidency towns, or to men in the Government secretariats.

Major Woodruff pleads for short tours of duty in the Philippines, he says two years in these islands is as bad as five years in India. One great difference is that in the Philippines there is no cold weather. There is not much in Southern India or in Ceylon, but we do not think that Europeans there are as neuasthenic and broken-down as Major Woodruff depicts his own countrymen to be after a short stay in the Philippines.

We commend this book very strongly to our readers, it is very suggestive and very interesting. It is useful, too, in directing our attention

to the avoidance of the ill-effects of tropical light rather than tropical heat which has been hitherto generally considered the great bugbear of these climes, though, on the other hand, there is some danger that Major Woodruff in his denunciation of "light" may forget the other factors that make for ill-health in the tropics "*Un mot l'obsède*," as Renan finely said of St Paul, and this is an ever-present danger before the writer on a special thesis

Current Topics.

THE CHAIR OF MILITARY MEDICINE AT THE R A M COLLEGE

THE following announcement appears in the *London Gazette* of 8th September 1905 —

"Royal Army Medical College—Lieutenant-Colonel R J S Simpson, M B, C M G to be Professor of Military Medicine, *vice* Lieutenant-Colonel K Macleod, M D, Indian Medical Service, retired pay, who has vacated that appointment, dated 22nd August 1905"

While congratulating Lieutenant-Colonel Simpson on his new appointment, which we do not doubt that he thoroughly deserves, we cannot help regretting the breaking of the tradition, by which the appointment of Professor of Military Medicine in the Army Medical School has always hitherto been held by an officer of the Indian Medical Service. The professorships of military surgery and of hygiene have always been held by officers of the Army Medical Department, while that of pathology was until recently held by gentlemen who had not served in either service, Sir William Aitken and Professor A. E Wright. The former, however, had served as a Civil Surgeon in the Crimean War.

When the Army Medical School was first founded at Fort Pitt, Chatham, in 1860, Surgeon-Major Charles Morehead, of the Bombay Service, was appointed as the first Professor of Military Medicine. He resigned in the following year, and was succeeded, in March 1861 by Surgeon-Major, afterwards Surgeon-General, William Campbell Maclean, of the Madras Service. Dr Maclean moved with the school from Chatham to Netley, and held the chair for the long period of 24 years, retiring in 1885. His successor was David Boves Smith, of the Bengal Service, who had retired in 1882 from the Principalship of the Calcutta Medical College, and was at the time practising in Calcutta. He only held the chair for four years, dying in harness on 3rd June 1889. The next occupant was Brigade-Surgeon Henry Cayley, also of the Bengal Service, who had retired from the Professorship of Ophthalmic Surgery in the Calcutta Medical College on 29th April 1887.

He held the post for eight years till 1897, and after his retirement served in South Africa, in charge of the Scottish Hospital, he died last year, on 19th March 1904. His successor, the last thus officer to hold the chair, also came from the Indian Medical Service, Brigade-Surgeon Kenneth Macleod, who was Professor of Surgery in Calcutta and for many years the Editor of this Journal.

MALARIA IN CALCUTTA

WE may remember how medical men were puzzled, not to say startled, over the announcement by Drs Stephens and Christophers that the mosquitoes in Calcutta were non-malaria-carrying ones and also that the malaria index in Calcutta was *nil*, contrasting with an increasingly high index of 7 in Barrackpore, 12 in Jalpaiguri and 72 in the Duars. Stephens and Christophers made their observations in June, July and August, but it appears from the short paper we reproduce below by two such skilled observers and zoologists as Lieut-Colonel Alcock, F R S, I M S, and Lieut Colonel J R Adie, I M S, that other and definitely malaria-bearing mosquitoes can be found at other seasons of the year in Calcutta, and the existence of *Anopheles* (*Myzomyia*) *Listoni* is only in accordance with medical experience in Calcutta as to the undoubted prevalence of a certain amount of endemic malaria in and around the city —

On the occurrence of Anopheles (Myzomyia) Listoni, in Calcutta. By J R ADIE, M B (Lond.), Major, I M S, and A ALCOCK, M B, LL D, F R S, Major, I M S.
Received April 15th,—Read May 18th, 1905.*

Stephens and Christophers, in their original report† to the Royal Society, on the Relation of Malarial Endemicity to Species of *Anopheles*, state, as their second conclusion, 'that the distribution of *A. Christophersi* [= *Myzomyia Listoni*] corresponds closely with an area of extremely high endemicity."

It will be remembered that they were discussing the relation of malarial endemicity to species of *Anopheles* in Bengal, that they found this endemicity to vary from 0 in Calcutta to 7 in Barrackpore, 12 in Jalpaiguri, and 72 in the Duars (increasing as they proceeded north), and that they concluded "that the distribution of certain species coincided with areas of high endemicity, while other species occurred, and even existed in profusion, where very little infection was present."

All this is graphically illustrated in their well known "Sketch Map" (reproduced in their new book) which shows the Calcutta region marked *Rossi* as a non malarial carrier, and the Duars marked *A. Christophersi* [= *M. Listoni*] an undoubtedly good carrier.

Stephens and Christophers were careful to say that their observations relating to distribution and endemicity in Bengal were conducted in June, July and August, and though they came to the general conclusions quoted above they insisted that much more extended observations were required.

In the second edition of their book,‡ just published, this generalisation is repeated—"We may have countless numbers of *M. Rossi* as in Calcutta (environs) and get a malarial index of 0, and this appears to hold good in Madras, Bombay, and, as far as our observations go,

* From Proceedings of the Royal Society, Vol 7 B

† Malaria Reports, Sixth Series, March 6, 1902

‡ 'Practical Study of Malaria,' p 208

universally. On the other hand, where we find *M. Listoni*, *M. culicifacies*, *P. Jeyporensis*, in India we have a high endemic index."§

This preface is necessary in order to realise the importance of the discovery lately of *M. Listoni* in Calcutta.

During the last Christmas holidays we found, in the Mussum tank|| in Calcutta, considerable numbers of *Anopheles* larvæ, which were immediately examined and referred to the *nigerrimus* and *culicifacies* groups. On breeding out, these were found to be *M. nigerrimus* and *M. Listoni*, the former being much more numerous. The larvæ were found in shady spots near the bank chiefly near and under a raft. There was abundant aquatic vegetation and fish (*Cyprinidæ*, *Succobrancheus* and *Uphiocephalus*) are numerous, it was, in short, an ordinary Calcutta tank. Our specimens show very well the palpal bands as described by Stephens and Christophers, "palpi, two broad apical bands one narrow basal"¶.

This capture, in the first place, extends the geographical distribution of this species given in the books. It is the only malaria carrier that has been reported from Calcutta, other *Anopheles* being *Rossi*, *fuliginosus*, *nigerrimus*, *Stephensi*. In the next place it seems to show—as, indeed, would be expected *a priori*—that generalisations as to seasonal prevalence of specific *Anopheles* and endemic indices deduced therefrom can only be made with confidence when observations are carried on throughout the year.

"Endemic index" is described as the percentage of infected children in any district, and in the investigations of the Malaria Commission the figure 0 for Calcutta was arrived at by the examination of only 191 children in June, July and August, and was regarded as confirmed by the absence during those months of all the known malaria carriers.

Now, however, that the approved malaria carrier *Anopheles (Myzomyia) Listoni* is known to be present in Calcutta in December and January (none have been found in February), it seems reasonable to suppose that the June–August observations may have merely coincided with the trough of a then dormant endemic curve for Calcutta. This would be agreeable to clinical experience, for the statement that there is no endemic malaria in Calcutta was a blow to many medical men in that city.

Incidentally we should like to put on record, as an outcome of the present report and as a suggestion for other observers, the results of an experiment under taken to discover the natural foes of *Anopheles* larvæ about which, it seems, more is taken on hearsay than is actually known.

On February 7th three sets of larvæ of all ages were placed under conditions as natural as possible in three separate cages. In the first cage, there were twelve larvæ in water from which other aquatic animals had been strained. From these four adults hatched out. In the second cage, there were fourteen larvæ in "strained" water. From these five adults hatched out. In the third cage, there were twelve larvæ and a single rapacious larva of a dragon fly (the common *Ceriatrion coromon delianus*). In this cage all the *Anopheles* larvæ disappeared, and on February 22nd an adult dragon fly hatched out.

GOAT'S MILK AND MALTA FEVER

WE have already commented upon the first two parts of the Report of the Commission appointed by the Admiralty, the War Office and the Government of Malta for the investigation of Mediterranean fever, under the supervision of an Advisory Committee of the Royal Society.

The third part is now published (August 1905), and is very satisfactory in that it announces a very valuable and important discovery in the connection between the use of goat's milk and this mysterious disease.

It appears that the credit of this discovery is due to Dr T. Zammit, of the Malta Board of Health. It seems that Dr Zammit had been making experiments by feeding goats with *M. melitensis*, and the results of these experiments were communicated to the Committee in the end of May 1905. Dr Zammit having announced that he considered goats to be "susceptible to Mediterranean fever, and that the disease is spread to human beings by goats," immediate steps were taken to test and prove these statements.

Major W. H. Horrocks and Captain Crawford Kennedy, R.A.M.C., immediately proceeded to examine the numerous herds of goats in Malta, and on 23rd June Major Horrocks wrote that he had "discovered the *M. melitensis* in the milk of an apparently healthy goat, and subsequently they sent in the reports which appear in Part III of the Commission's Report, which conclusively shows that (1) "one or more apparently healthy goats in every herd are excreting *M. melitensis* in their milk and urine, (2) that about 50 per cent of the goats in Malta react to Mediterranean fever when examined by the serum agglutination test."

The Commission thereupon remarks—"It may be objected that no exact proof exists that the drinking of milk containing *M. melitensis* will give rise to the disease in man, when we take into consideration, however, the results of the feeding and inoculation experiments on monkeys, it may be assumed with safety that the disease is propagated in this way, and that no time should be lost in removing such a grave and insidious danger to the public health."

No one who reads the reports of Major Horrocks and Captain Crawford Kennedy will have any doubt of the existence of the Malta fever poison in the milk of the goats, which supply milk to the garrison, but one or two points inevitably suggest themselves. In the first place, we presume that children are large consumers of goat's milk. Has any special prevalence of Malta fever been observed among the soldier's children in the garrison, or is Malta fever a common disease of the Native children of the Island, adult natives we can understand are immune?

Again we ask, is the specific reaction in the serum test for this fever absolutely above suspicion? We all know that Sir P. Manson, as well as many observers in India, have protested against deductions being made from this serum test, and the well-known case where (by this test made in a well-appointed laboratory) Dr C. Bentley and others were totally misled into believing that kala-azar cases in Assam were cases of Malta fever, has made us extremely

§ See also Malaria Reports, Series VII, p. 23.

|| Conveniently situated in rear of the new United Service Club, Calcutta. I.—Ed., J. M. G.

¶ P. 195, new edit.

sceptical as to any deductions about the nature of any disease based *solely* on Malta fever serum reactions. We put more trust in Major Horrock's discovery of the *M. melitensis* in the milk and urine of goats.

Does Malta fever exist in India? We, several years ago, announced the existence of cases in India, cases we believe based solely upon the serum reaction, which, as said above, we now distrust. We venture to think that Malta fever does *not* exist as an indigenous disease in India, and shall be much obliged if any one of a contrary opinion will give us the grounds for his belief, based upon something more substantial than this misleading serum reaction.

MADRAS EXPERIENCE OF SEPTIC TANKS

We quote the following paragraph from Colonel W G King's report (San Comm Report, Madras, 1904, p 23) —

"While at some future period, therefore, septic tanks may be useful additions to sewerage systems in this presidency, I believe that the very simple principles adopted in the original experiments by the Massachusetts Board will be those that will receive most favour in this presidency. The typical intermittently continuous filters to which I refer, possess hard media not easily broken down by sewage—so packed as to permit of free aëration during the trickling of the sewage over each part. Coarse sand, washed gravel of selected sizes, and broken stones afford the necessary media. These are materials that are to be found freely in most parts of the country, and with them can be made decidedly efficient filters. To retain them in form certainly requires in many positions no expensive masonry bounds. Earthen bunds such as natives are well accustomed to build for retention of small bodies of water suffice, or even this may not be in some cases necessary where the filter, by being sunk below ground level, can yet possess an exit at a lower point. Volumes have been written on the subject of sewage filtration, and many side issues have been raised and improved methods of application of sewage have been thought out, but after all said and done, no necessity has been established for securing any better method than the use of the media above stated well aerated, where the intermittently continuous method is feasible. If the filtration media and their building up be then usually a cheap matter, so also I conceive the method mentioned particularly well suits the disposal of sewage of the nature likely to be encountered in most localities in this presidency. It is composed of the usual domestic sullage, washings of stools and cowsheds, whilst human faecal matter is represented solely by diluted ablution water and the washings of latrines. Moreover, in towns devoid of manufactures, the sewage discharged at night is small so that time for aëration is possible in the case of public filters, and where the method is applied to private houses, the influence of intermittency of sewage discharge, followed by a rest at night, is self evident. Consequently, contact filters and septic tanks have not been particularly encouraged by me. The first filter was erected, under my superintendence, on the intermittently continuous plan in this presidency at Vizagapatam in 1895. It had a surface area of 22 feet by 19 feet and a depth of 6 feet. The filtration media consisted of coarse sand, gravel and road metal under drained by country pipes. Although only enclosed by earthen bunds clay lined, this sewage filter gave excellent results for nine years. Its object was the purification of sewage water (7,000 gallons) received from part of the drainage system of the town that would otherwise have

been discharged into the swamp, and thus have caused a nuisance. Filters on the same principle were introduced subsequently at Vizianagram, Bezvada and Kumbakonam. The site, however, where this first attempt at sewage filtration was made at Vizagapatam, is hardly now recognizable. The dismal swamp that gave shelter for the breeding of anopheles mosquitoes has been to a large extent now reclaimed by the use of the more durable parts of town rubbish, and there has been established a large well cultivated, and profitable sewage farm. My old earth bund filter has been replaced by one built of masonry, in which improvements as to sewage distribution and aeration have been made by [the late] Major Vickers, I M S, whilst the carrying out of this and steady perseverance in reclaiming the swamp is due to Mr Narayanamurthy Pantula, Rao Bahadur who, for several years, was Chairman of the Municipality. The farm is an excellent object-lesson of what a district medical officer having an interest in sanitary matters can effect, when supported by an energetic and willing Chairman. Although only recently formed, this farm secured a net profit of Rs 1,289 during the year. In this case, the crude sewage yielded under bacteriological examination by the Superintendent, King Institute (Lieutenant Christophers, I M S) by the phenol method 2 176 colonies of *b. coli* per c.c., whereas the filtrate gave 1,634 per c.c. Unfortunately records of the results from land irrigated with the crude sewage and filtrate respectively have not been maintained, as promised me. On this subject of so much importance, there is, however, in process an experiment at the King Institute, where complete plant consisting of a septic and storage tanks two Dribbin filters and an intermittently continuous filter have been arranged for receipt of the sewage from the dwellings laboratories and calfsheds.

Unfortunately, as the drainage system is not yet complete the obtaining of full results is not yet possible. But so far, it would seem that the crude sewage would give the better results. In this case every care is being taken to prevent land intended for experiment with crude sewage being exchanged with that intended for use with the filtrate, virgin soil was purposely selected. Close to the Institute is another sewage farm with an intermittently continuous filter in operation for receipt of the sewage from Government House, Guindy. The sewage from this place was discharged formerly without treatment, and was a nuisance which has now been completely removed."

ORAL SEPSIS OR SCURVY

We clip the following interesting note from the Chairman's address at the American Medical Association Meeting at Portland, Ohio. It is by Dr V A Latham, of Chicago, and bears strongly on the question of oral sepsis and dysentery, which was discussed by Major F J O'Kinealy, I M S, in our special number (July 1905) —

"Our public institutions, such as asylums, jails, county hospitals, and industrial homes have outbreaks of dysentery, stomach and intestinal troubles which are attributed to dyspepsia due to unsuitable food and to confinement with crowding. *How many are really due to unhealthy conditions of the gums, mouth, teeth, and are often classed as scurvy?* Let these patients be urged to clean the teeth and mouth, using some toothpick, brush, dentifrice or antiseptic wash, and many patients would recover without any change of diet. Let the cleansing of feeding vessels with sterile sand, plenty of soap and hot water be insisted on and diarrhoea, dysentery and alimentary troubles generally would become nil. Why should not a dentist be appointed to inspect mouth, gums and teeth of every inmate on the Monday

parades' The dental outfit should be paraded with the rest of the prisoner's or inmate's equipments. A few extra marks given for attention to these details, and for the neglect of them punishment would benefit both health and discipline. Prisoners and patients, like other human beings, when dyspeptic or with sore teeth, mouth and gums, or when otherwise out of sorts, are liable to take a distorted view of things and to become fractious. Picture a patient without proper means of cleaning his teeth for long periods at a time. The accumulations of tartar, a certain amount of septic material or the *Oidium albicans* (the latter especially if the person is debilitated from some exhausting disease as typhoid, pneumonia, influenza, malaria, and if he is receiving milk in his diet) are not long in working their effects. The gums and teeth become congested, tender, and lead to the bolting of food, which, being held in the stomach, causes fermentation with dilatation and cardiac gastric and intestinal troubles and the natural sequences, diarrhoea, colitis, appendicitis, biliary catarrh and dysentery. If one believes in the 'dysentery ulcers' of the mouth (Cheyne and Burghard), although their exact relation to the stomache condition is not clear, it is easy to infer how the etiology is established and the course of disease continued. I believe that in many jails in Bengal steps are taken to enforce cleanliness of the teeth by toothpicks, use of toothpowder made of charcoal and powdered burnt alum. The East Indian and African in free life is very careful of his teeth, and every opportunity should be given him in prison to keep up this cleanly practice."

The above remarks contain several good hints, and are commended to the attention of medical officers in charge of prisons, asylums and regiments in India.

THE FOOD OF THE ANKYLOSTOMA

IN the magnificent monograph, which forms the whole of Volume III of the Records of the Egyptian Government School of Medicine, Dr A. Looss, the well-known helminthologist, devotes no less than 158 large pages to the anatomy and life-history of the ankylostoma duodenale (*Dub*). This is the most complete description of any intestinal worm in existence and in a monument of Professor Looss' erudition and more than Teutonic patience and thoroughness. We cannot here touch upon the minute description given of this little worm, but we must call attention to one portion of Professor Looss' work in which he describes the food of the ankylostoma.

Ever since the discoveries of Bilharz and Giesinger the ankylostoma has been regarded as the typical bloodsucker, and to the consequent loss of blood much of the illness of the host has been attributed. But every now and then observations have been made which were not in harmony with this view. In some cases of anaemia the disease was severe, but the few worms found *post-mortem* could not possibly have caused the depletion, and worms were also found empty of blood and not even attached to the intestine. So long ago as 1884 Sangalli made the statement that the food of the ankylostoma was not blood, but intestinal mucus, but his observations attracted comparatively little notice, and when noticed were explained away.

A belief, however, grew up that besides sucking the blood of their host, these worms had a

poisonous effect, and the greatly developed cephalic glands of the ankylostoma are organs which might well produce secretions of a noxious or poisonous nature, and this Prof. Looss believes to be the case. He concludes his section on this point in the following words: "the normal food of the ankylostoma is not the blood, but the tissue of the mucous membrane and submucosa of the human intestine. Blood is only sucked in when the parasite accidentally pierces a blood-vessel in the submucosa."

We commend this admirable monograph, which is illustrated in a way which is exceedingly creditable to the Egyptian Medical School, to all who are interested in this very common parasite in India, a fact which makes the total absence of any reference, in this monograph, to the existence of this worm in India as remarkable as it is misleading.

KELLY ON THE OPERATION FOR APPENDICITIS

KELLY (American Medicine) in an interesting paper on this subject states that there are three principal objects to be attained in the technique of removal of the vermiform appendix, namely: "(1) To remove the appendix without contaminating the surrounding peritoneum with any of the bacterial flora, which are often virulently infectious and always abound on its mucus surface, (2) to treat the mucosa in such a manner as to prevent any contamination while closing the opening into the bowel made by the amputation, and (3) to dispose of the stump so as to avoid any risk of infection after the closure." The author's method of operation is as follows: "The appendix is exposed, and the mesoappendix is tied off. A circular suture of fine silk is then laid around its base, about a centimeter distant, but not drawn up. The appendix is then grasped at its base with the forceps and crushed, while just beyond the forceps (distally) it is seized with an ordinary artery forceps to prevent the escape of its contents. Paquelin's cautery is now used to amputate the appendix between the two forceps, when it is laid aside in the grasp of the artery forceps. The crushing forceps, which is now to be converted into a cooking, sterilizing, sealing iron, is carefully isolated by tucking dry gauze under each blade, so as to lift the end of the forceps up on a cone, away from all contact with the caecum. The next step, which is the most important one, is to keep the red-hot point of the cautery slowly travelling up and down the groove in the crushing forceps for from forty to sixty seconds, so as to burn off every vestige of the stump, and at the same time to heat the forceps so thoroughly that the narrow ribbon of crushed appendix in its grasp becomes converted into a translucent gistle-like substance, in which the lumen of the appendix is completely destroyed. The lumen is so effectually obliterated that it never gapes. The final step is the tightening

of the purse-string suture, and the inversion of the crooked base, after which the serosa is carefully sutured over the whole with another row of fine silk sutures. "The author considers the advantages of his method to be "Its perfect simplicity. There is at no time any exposure of the infected mucosa. The stump is not ligated or bruised, and thus left as a culture medium for whatever organisms may have lain in it. The appendix is amputated with the cautery and the proximal portion is sterilized and effectively sealed. The inverting sutures are then applied over an area as free from contamination as the rest of the peritoneal cavity."

THE PHIPPS INSTITUTE FOR STUDY OF TUBERCULOSIS

"We have before us the first report of this Institute which was founded in 1903 by Henry Phipps who also maintains it. The purposes of this institute are "the study of the cause, treatment and prevention of tuberculosis, and the dissemination of knowledge on these subjects, the treatment and the cure of consumption, the benefits shall be administered without regard to race, creed or colour."

The work began in a house in Pine Street, Philadelphia. The present report gives a good account of the first year's work, and in the year 2,039 patients were treated. Full details are given of these cases. The rest of the volume is made up of a report on coloured patients, a statistical study of tuberculosis in Philadelphia, and an admirable account of the tuberculosis work at Saranac, with description of the Tuberculosis Cottage Sanitarium on the Adirondack. Dr Osler contributes a valuable lecture on the Home and tuberculosis, Dr Hermann Biggs on the administrative control of tuberculosis, and Dr E Maraghano gives a long lecture, both in Italian and English, on specific therapy in tuberculosis.

There is a lot of common sense in the following extract from the *Charlotte Medical Journal* (August, 1905) on the subject of typhoid as an "unnecessary evil" --

"We lost nearly four thousand men in the Spanish war from carelessness and flies, and several people wrote papers about it, but the flies and the carelessness go on just the same. It is a pity to lose four thousand strong men in the prime of life, but to lose them to no purpose is more pity. It lies with the profession to do some great good work along this line. Talk to your people about it."

The drinking water, the patient and the fly and the greatest of these is the fly.

We must have the water, let us see that it is pure, we may have the patient, let us see that he is clean, but the fly must go.

The fly in typhoid, cholera, and probably dysentery is almost as important as the mosquito in malaria, yet we know but little about flies, their habits, habitat and natural history. Will some one not take up this study?

A VERY complete monograph on Rocky mountain or spotted fever is published as Bulletin No 20 of the U S Public Health, &c, Department. It is written by Dr. C W Stiles. It is of value to all who are interested in proplasmiasis in man or animals.

THE Committee appointed after the Surgical Congress held in Paris in January to investigate Dr. Doyen's alleged serum for the cure of cancer has reported adversely to his claims. Twenty-six patients were under observation for the purposes of the test and twenty of these were worse. It is also stated that the existence of the so-called micrococcus neoformans could not be demonstrated.

Reviews

Practical Pediatrics - A Manual of the Medical and Surgical Diseases of Infancy and Childhood - By Dr E GRAETZER, authorized translation, with Additions and Notes, by HERMAN B SHEFFIELD, M.D. Pages xii-544. Crown 8 vo, flexible cloth, round corners. Price, \$3.00 net. F A Davis Company, Publishers, Philadelphia.

THIS work, as stated by the author in the preface, is intended as a reference book for the use of general practitioners, and has been written with the endeavor of presenting briefly, but clearly, everything worthy of attention from the modern standpoint. A number of notes and additions have also been inserted by the translator, who aptly terms the book "A miniature encyclopædia of the medical and surgical diseases of infancy and childhood."

The first part opens with a chapter on the care of the newborn infant, and infant feeding, in which is a specially useful section dealing with the selection of the wet nurse, when one is considered necessary. There is a short section on physical diagnosis which contains several practical hints. This is followed by chapters on the diseases of the new born child, and congenital malformations, after which come sections dealing with diseases of the various organs and systems, commencing with those of the nose, ear and throat, etc. In the chapter dealing with contagious and infectious general diseases, under the heading of diphtheria, there is an excellent and clear description (inserted by the translator) of the method of performing intubation.

The second part of the book is devoted to *Materia Medica* and *Therapeutics* commencing with Hydrotherapy, the opening sentence of which - "A good rule to follow in the treatment of diseases of infancy and childhood is never to give a drug when any other remedial agent may be employed," is one well worthy of attention. Electricity, massage, climatology, dietary of the child in health and disease, and

palatable prescribing are all briefly dealt with. The part closes with a short description, with illustrative prescriptions of the drugs most commonly used in practice.

The only adverse criticism that can be made is, that by the very brevity of the work, many subjects appear to have been very superficially dealt with, but this, perhaps, could not well have been avoided if the book were to be kept within small limits.

The book will no doubt supply a want felt by many practitioners for a work of the kind. It is admirably and clearly written and abounds in sound, practical, and commonsense ideas, and can be strongly recommended as a useful work for rapid reference, more especially as to practical hints on treatment.

The translator is to be congratulated on the satisfactory manner in which he has carried out his part of the work, and the additions he has made greatly enhance the value of the book.

The printing, binding, and general get up of the volume leave little to be desired.

Character and Identification of Drugs—

By THOMAS H. BONNAR, Asst-Surgeon, I.S.M.D. Calcutta. Sanyal & Co, 1905. Price, cloth, 2s.

THIS is an admirable and useful little book, written by Mr. T. H. Bonnar, the Teacher of Pharmacy in the Medical College, Calcutta. It is dedicated to Surgeon-General Bomford, C.B.E., I.M.S., and has been compiled for the use of students preparing for examination in Materia Medica and Pharmacy.

It contains notes on the description of 180 drugs, all of which a student is expected to be able to identify. It is admirably illustrated, and contains an excellent glossary of botanical terms used in Materia Medica. We wish we had had such a useful book, when working for our Materia Medica examination. It should prove very useful to Medical students in India and to compounders, and we hope to hear of its being adopted as a class text-book in all the medical schools of India.

"Verb Sap" on Going to West Africa—

By ALAN FIELD, F.R.C.S. London, 1905. J. Bale, Sons, and Danielson, Ltd. Price 2s. 6d.

THIS is the first volume of a series to be called the "Verb Sap" series. It is intended as a guide to men going out to West Africa either in Government or private employ. It is written in a very unconventional style, but is literally brimful of useful information. It has a preface by Sir Alfred Jones, K.C.M.G., who has done so much for the sanitation of our Colonies on the West Coast of Africa. It is certainly a book which no one going to West Africa can afford to do without. The first chapter deals with outfit and estimate of expenses. A description of the voyage from Liverpool to Lokoja is then given. The chapters on the life and the social amenities and on "servants and other

pests" are not only amusing but instructive. The chapters on sport are full of useful and practical advice, on bird and beast, on the choice of saddlery, horses and native "vets." Sir H. H. Johnson, G.C.M.G., contributes a section on shooting and natural history. The chapter on languages will be found most useful. The medical advice given is always sound and to be trusted. The book is a veritable Griffin's Vade-Mecum, and can be strongly recommended to all who go to seek a career or fortune in our West Coast Colonies.

Lateral Curvature of the Spine and Pelvic Deviations—

By RICHARD BARWELL, F.R.C.S. Pages XII and 103. Illustrations 42. 6th Edn. Crown 8vo. Price 3s. net. London, Baillière, Tindall and Cox.

THIS book though appearing as the 6th Edition has been completely re-written. The first chapter deals with diagnosis, the different forms of curvature are described, attention is drawn to the point that in the early stages the line of the spinous processes is practically straight although there is already a good deal of rotation present and that the difference between the side outlines of the body shows the amount of deviation much more accurately.

Pelvic deviations are next considered, their causation and how they produce secondary spinal changes. A very good plan is described by which a photograph of the nude patient can be obtained without any indecency. The correction of habitual pelvic deviations is well described and severe strictures passed upon the cumbious spinal supports which used to be so frequently employed.

A large portion of the book is devoted to treatment and contains full directions on this important part of the subject, the correction of pelvic obliquity, various exercises and the stretching of the contracted muscles and ligaments on the concave side of the curve are excellently described.

There are many good illustrations, chiefly derived from photographs.

The Principles and Practice of Asepsis—

By ARTHUR STILES VALLACK, M.B. Ch.M. (Sydney), L.M. (Rotunda), Surgeon to the Berrima District Hospital, New South Wales. London, Baillière, Tindall & Cox, 1905, pp. 105, Fcap 8 vol. Price 2/6 net.

THIS small work is intended, as stated by the author in the preface, to describe a practical and efficient system of asepsis.

The first part deals with tissue resistance, and the author very rightly lays stress on the great importance of the reparative powers of nature in the healing of wounds. The second part treats of wound infection of high virulence such as erysipelas, etc. The third portion is devoted to a consideration of the aseptic treatment of operation wounds. In this section great stress is laid on the impossibility of the

thorough disinfection of the skin, both of the Surgeon's hands, and of the patient, and the use of rubber gloves for all those assisting in the operation, and for the operator himself, in any but aseptic cases, and even in them if possible, is strongly insisted on. The common error of tying stitches too tightly is rightly referred to as a frequent source of stitch abscess. The preparation of ligatures, etc. is briefly dwelt on and the author gives a new method for the sterilization of catgut. In the fourth part of the book the question of the treatment of septic wounds is described. And in fifth part advice is given as to how to deal with accidental wounds.

The book concludes with two appendices, in the first of which instances are given of wound infection due to septic catgut, and in the second, cases are quoted in which septic organisms were apparently introduced into wounds by the hands of the surgeon or his assistant.

Unquestionably the aseptic treatment of wounds is the highest ideal of surgery and gives the best results, but it requires, not only an early, thorough, and systematic training of the surgeon himself, but also a most thorough training of all nurses and assistants, and in this country especially, where the assistants and nurses lack the thorough and prolonged training they get at home, it is extremely doubtful whether the risks of aseptic surgery would not more than counterbalance the advantages it unquestionably possesses over anti-septic methods.

In conclusion we may say the book is a thoroughly useful and practical work and it is written in an eminently readable form. We can most strongly recommend it to surgeons, students, and nurses alike, as one that will well repay careful study.

The printing, binding, etc., of the work leave nothing to be desired.

ANNUAL SANITARY REPORTS

I UNITED PROVINCES

THE Sanitary Report for the year ending 31st December 1904, in the United Provinces, is written by Major J. Chaytor-White, M.D., D.P.H., L.M.S., the Officiating Sanitary Commissioner.

The birth rate was 46.6 or above the normal, the death rate was 34.7 as compared with a five year mean rate of 33.5. The year 1904 had a much larger death-rate from plague, but fever was less and the great epidemic of measles to which no less than 82,820 deaths were attributed in 1903, had practically died out.

The infantile death rate is still very high 226 per mille but lower than the ten year average (1891-1900) which was 229.4. In 1904 the satisfactory result seems to have been due to the lesser prevalence of measles, as only 14,460 deaths were attributed this year to measles as compared with 82,829 in the year 1903.

On the subject of registration the following remarks of the Sanitary Commissioner are pertinent:—"More extensive checking of registration in these districts appears to be very desirable. Without good registration a Sanitary Officer is severely handicapped. If the data he has to go upon are incorrect his conclusions will probably be quite wrong. In England registration is so good and the returns supplied by the Registrar General so accurate, that the deductions made from the figures supplied admit of little criticism. Here, in

India it is widely different. The figures are supplied by probably the cheapest registering agency in the world—the chankidar at Rs. 3 a month—and the results are very far from good. During the past three years the Provinces have been badly infected with plague, and the mortality is probably much higher than has been reported. When the chankidar runs off or dies of plague no one reports the deaths. When panic occurs or when concealment is desired this also happens. People who run away from their own village and die elsewhere are rarely reported by the chankidar. Under the circumstances it will be a matter of surprise if the deduced population of the intercensal period is found to be anything like correct."

Cholera was not much *en evidence* in 1904 in the previous year much cholera had spread from the Kumbh Mela at Harwar, the rate being in 1904 only 14 per mille as compared with the decennial average of 1.2. Small pox had a fairly high rate being 15, the average being 13.

Plague was the recorded cause of 179,082 deaths or a ratio of 3.75 per mille more than double the death toll of the previous year. The following districts were worst affected: Ballia (rate 17.6 per mille), Ghazipur (14 per mille), Azamgarh (11), Allahabad (9.3) and Lucknow (9.4 per mille). March was the worst month and July had the lowest mortality. There were only 3.25 persons inoculated against plague, and of these no less than 3,010 were in one city, Bareilly.

Fever.—The ratio is given 23.9, as compared with 27 in 1903 and 25 the five year average. October was the worst month and July the best as regards "fever mortality. On antimalarial measures Major Chaytor-White remarks as follows:—

"In many districts increased efforts were made to improve surface drainage: pits and excavations were filled up and a large amount of drains laid out. Every endeavour was made to bring quinine within reach of the poorer classes but no organized proceedings on a large scale were initiated to destroy mosquitoes and their larvæ. It seems to be now accepted that the spasmodic efforts of a mosquito brigade effect little but temporary improvement. Permanent works find more favour with municipalities than the distribution of quinine are the best practical means at our disposal for combating malaria in large communities."

The following figures show the amount of filtered water provided and consumed per head of the population in the chief cities in the United Provinces:—

Benares	17 gallons per head
Lucknow	6 " " "
Cawnpore	15 " " "
Agra	10½ " " "
Allahabad	10½ " " "
Meeun	4½ " " "
Debra	7 " " "
Mussoorie	6 " " "
Naini Tal	6 " " "

The amounts vary greatly, but are all small. The amount of water consumed or wasted will depend very largely on the number of drains flushed and above all on the number of house connections, the most fruitful of all sources of waste. As showing the vital importance of combining drainage schemes with water supply schemes, the following remarks may be quoted:—

"As stated last year, in cases where both a drainage system and a water supply have been introduced, the date of completion of the water-works being earlier, has been taken in calculating death rates for the periods preceding and subsequent to, the introduction of the works. It will be seen that the death rates since the introduction of water supplies are generally higher than before the introduction. In the large cities where this has occurred, plague has no doubt been the chief factor in the increase, but as has been pointed out by me in a previous report, the water supply in these towns was introduced before the drainage system was placed on a sound footing. Obviously where the consumption of water is increased from three or four gallons per head a day to 12 or 15 means should be supplied for removing the waste, as when water remains in the vicinity of habitations it forms pools and breeding places for mosquitoes, while the sub soil becomes water logged and unhealthy."

II—PUNJAB

THIS report is submitted by Lieutenant Colonel C. J. Bamber, D.P.H., L.M.S., the Sanitary Commissioner. The statistics show the same death-rate practically as in the previous year, only that in 1904 the place of malaria has been taken by plague.

The birth rate kept up to the mean ratio of 41.4, so that in spite of the terrible prevalence of plague the birth rate remains high. The death rate was 49 per mille, or just one million deaths, of this enormous rate no less than 19.7 per mille is put down to plague.

Cholera but little prevailed in 1904 in the Punjab, small pox remained with an average rate of mortality. The following remark of the Sanitary Commissioner is worth quoting—

"As regards seasonal prevalence it is remarkable that plague and small pox follow a similar course. Plague like small pox breaks out on the approach of the cold season, increases steadily in the winter, attains the maximum intensity by about the same time or some weeks earlier than small pox, and declines with the commencement of the hot weather. In plague the decrease is most rapid, while in the case of small pox it is gradual."

Plague was the disease of greatest importance during the year in the Punjab. Of the 29 districts in the province only three escaped, viz., Kangra, Mianwali, and Muzaffargarh, and in two of these imported cases occurred, but gave rise to no epidemic. In the year 1904 no less than 402,950 deaths from plague were reported, this is the most severe of all plague years in the Punjab. Voluntary inoculation against plague was done in 55,384 cases.

As regards disinfection over 49,000 locusts were desiccated and 28,000 "chemically disinfected." The "Jullundur pattern stove," which is not described, was used in a majority of the cases of desiccation. The following is the rather melancholy account of the attitude of the people—

"In general, the attitude of the people was not in favour of the plague measures adopted by Government. Even in the Jullundur and Hoshiarpur districts, whether the advantages of these measures are well known, the people when advised by officers to adopt them, commonly replied that they were tired of plague measures that it was no use fighting against fate (*ismet*) and that nothing but the will of God could remove the disease from amongst them. Complete evacuation of infected villages was observed only in a very few instances, but some infected towns, such as Beri in the Rohtak district, Maghana in the Jhang district, and Sarogdha in the Jhelum Colony, were almost completely deserted for some time."

Partial evacuation of infected villages was resorted to much more freely in some districts than in others. In the Ludhiana, Ambala, Jullundur and Hoshiarpur districts, for instance, it was common to find a considerable portion of the inhabitants of infected villages in camp, while in other districts, as in Shahpur, little or no attempts were made at evacuation.

The isolation of the sick and the segregation of contacts were but rarely resorted to, and were almost entirely limited to the poorest classes living in towns. European treatment was but rarely asked for both in towns and villages.

The power given in paragraph XXXV (B) of Punjab Government Resolution No 1936 L.P. dated 16th November 1903, to the people of uninfected villages to refuse access to persons coming from infected places was exercised only in a few instances.

Surveillance over animals was exercised in a very few places, Kunjah town in the Gujrat district and all Hill Sanitariums in the Punjab being exceptions.

In a very large proportion of infected towns and villages rats were stated to have been found dying or dead before human infection.

In addition to rats, squirrels, dogs, cats and monkeys are stated to have suffered from plague during its prevalence in many districts.

The infection is generally stated to have been conveyed by human agency or clothing, and from house to house by these agencies also, as well as by means of rats.

Sanitary surroundings also play an important part in the spread or otherwise of the disease. Most District Plague Medical Officers stated that the disease raged with greatest virulence in filthy villages and amongst filthy people.

High and dry parts of infected districts in most instances were less affected by the disease.

The prevailing type of the disease was bubonic, although pneumonic and septicemic cases of plague were also observed.

Most District Plague Medical Officers complain of the defective records of plague occurrences, especially non-fatal cases. That the reporting of cases was very imperfect may be inferred from the high percentage of case mortality, which has risen from 60.54 to 83.83 per cent during the year under report.

Moreover, the percentage of case mortality has never exceeded 70 during any of the previous epidemics.

III—MADRAS

This report has the additional interest in being the last Madras Sanitary Commissioner's Report to come from the hand of Lieutenant-Colonel W. G. King, C.I.R., D.P.H., I.M.S., who has during the current year been promoted and is now Inspector-General of Civil Hospitals, Burma.

The birth rate (per mille of the census population) is only 30.7 as compared with the recorded 28.3 for the ten-year

average, but much below the estimated birth rate of Stokes 42 or of Stuart 52 per mille.

The death rate is recorded as only 22.5 per mille, an extraordinary low rate compared with that given above for other Provinces of India, even when we consider how much less Madras has suffered from plague. The infantile death rate is a difficult question to settle owing to recognised deficiencies of registration, but it is given as 183 in most areas and 239 in municipal areas—on this subject Colonel King notes the following causes—Ignorance, overcrowding, sewage sodden soil, sanitation and bad feeding. Colonel King remarks on the opening there is for philanthropic people to open milk depots for providing sterilized milk.

Cholera—This reached what Colonel King has called the "decennial minimum rate." The following remarks on seasonal prevalence are of special interest—

"I have shown year after year, in these reports that incidence of the disease has a relation to months of the year, and not to whether a place lies to the north or south of the Presidency, and again that these months have a relation to the respective monsoons, or, in other words, each district in this Presidency is affected with cholera in relation to the commencement and completion of that monsoon which chiefly affects it. For example before I had worked out this fact it was usual to hold that the chief epidemic period in the Madras Presidency was November, December and January, whereas when the districts are divided according to the monsoons which chiefly affect them and the incidence upon the respective populations is ascertained, it is found that during the months of June, July and August, the south-west monsoon months, the incidence is just as great on the population of the south-west monsoon districts as it is in the north-east monsoon during October, November, December and January in the north-east monsoon districts. The confusion apparently arose from considering the matter solely numerically, when of course, as the population of the north-east monsoon districts is the greater, it was easy to prove that the months chiefly concerned with cholera in the Madras Presidency were in the latter end of the year. When cholera is introduced in a district in a season other than that in which its special monsoon affects it, the chances are very much in favour of its not spreading, but when introduced in a district at a period when its special monsoon affects it, the chances of spread are greater than in the opposite condition. Apparently, the cessation of cholera prevalence in a district is coincident with the attainment of the maximum height of the sub-soil water level. This sub-soil water factor is not easily understood. All I can say is, I am of opinion that the condition is recognizable. It is susceptible of several explanations, such as that the maximum water level represents a less favourable condition of inflow from a large drainage cone than when a well water is sinking, or in the act of rising, under the influence of present rainfall, or that, during the increasing inflow in the presence of a monsoon, there are added salts to the water, which favour the vitality of the cholera bacillus as it is known to do in the case of typhoid, or that the attainment of the maximum sub-soil water level being in a period considerably subsequent to the end of the monsoon specially affecting a district, it has nothing to do with the matter, but that the fact is that conditions of surface drainage and contamination of water thereby have synchronously diminished. Much of this is mere speculation but this, unfortunately, is the realm from which the sanitarian must gain much of the explanation of his observed facts, until the existence of bacteriological laboratories and their utilization is more common in India than at present. Moreover, the cholera microbe has unfortunately suffered much undeserved neglect at the hands of bacteriologists who have devoted such little attention—the word 'little' being used advisedly—as has been given in aid of epidemiology, to the plague microbe."

Whilst recognizing that monsoons have a modifying influence on the spread of cholera, I trust that it will not be thought that I for a moment imagine that this influence could be exerted, unless the insanitary acts of the human being which involve the scattering of the microbe were the first condition. For example I think it is unlikely that the low cholera rates for the last three years, namely, 9, 7, 6 have not been influenced by sanitary care."

Small pox was kept well under control.

Plague shows an increase, 29,000 as compared with 14,000 deaths in the previous year, or a rate of 5 per mille which contrasts very favourably with Bombay 12.1, Bengal, 1.0 Punjab, 19.7; C.P., 3.4, and United Provinces 3.7. The Madras "plague policy" is thus defined by Colonel King—

"The policy pursued by Government was that which has been steadily adhered to by it, since the first announcement of the existence of plague in Bombay. Any attempt at quarantine was at once forbidden, and a system of observation of all persons from infected areas, either within or without

the Presidency, without respect to rank or race, were subjected to surveillance by means of the passport system. The root of this system is, of course, to be found in the method pursued by the Local Government Board of England in reference to importation of cholera by sea into England. It has, however, been elaborated, so as to become a net work of surveillance authorities throughout the 141,705 square miles of the Presidency. In districts which are seriously indigenously infected the method is admittedly of much less value than elsewhere, owing to the numbers to be dealt with, but, undoubtedly, even here it has been of very great benefit. In districts not indigenously infected, 44 cases were imported during the year, and of these 30 were detected by means of the passport system, and the remainder by the sanitary and revenue staffs. Ten were detected in the huge City of Madras by passports. One hundred and ten cases were detected by inspection of railway passengers at Jalapet, two at Hindupur, and eight at Guntakal.

On the question of the spread of plague, Colonel Kings remarks may be quoted—

'I see no reason to change my opinion expressed in my previous reports that the plague introducing agent is, as a rule, man and that the rat is agent of spread of a disease acquired from man, and, therefore, becomes a very serious factor in disseminating the disease and completing the difficulty of dealing with it, but that the area within which rats become infected is usually small. When infected areas are close to each other, it is probable that grain infected by rats may strut plague in the place to which it is imported, provided the distance and time be small, but a very large number of the so called cases of infection by grain are really instances of conveyance by persons who have been in the infected area to purchase the grain. It is of course always possible a living infected rat may be imported in merchandise, and this was possibly the cause of the outbreak in Mangalore. Certain features of the epidemiology in this town, moreover, are consistent with Klein's belief in a form of the muerobo virulent to the rat, and but little so to man.

It may be accepted as an almost invariable rule that an indigenously plague infected town implies also an epizootic amongst rats or, at any rate, that no town can remain long indigenously infected without this occurring. Yet, in the large number of infected villages stated, after the end of the first epidemic in one year, the rats could not manage to start a new epizootic that could transfer the disease to man, nor did man reinfest the rats during the next year. My argument is therefore that plague is a much simpler disease to deal with than is generally allowed, and that if the country did but possess a permanent skilled sanitary service that would keep areas correctly under observation, plague could be kept within control. Its re-appearance after subsidence of the hot season is, I believe, due to the existence of scattered and unrecognized cases of plague, during a period when the plague microbe is sufficiently attenuated by meteorological conditions to select only the more susceptible victims, and when all local authorities will persist in pursuing the ostrich like policy of getting rid of every Sanitary Inspector they possibly can, the moment the hot season permits the report of a blank sheet. It is in this very hot season that every effort should be made to keep the sanitary staff up to the mark in strength and assiduity for the detection of stray cases, for complete disinfection of clothing of doubtful history and the killing of rats.

The subject of rat killing has attracted more than usual attention during the year 1904, on the part of local authorities, but it has, from the commencement of plague operations, been laid down as a part of official plague policy—more especially in respect to the precaution of killing rats *before* the advent of plague. In this Presidency, it has been found that houses can be kept free of rats from a period varying from a fortnight to six months, by the use of a mixture of common coal tar mixed with commercial sulphuric acid in the proportion of 9 to 1. Masses of the freshly prepared mixture are thrown at the entrances of rat holes or along rat runs. The fumes given off in holes are sufficiently objectionable to cause a desire to quit, and if no hole and no exit is left untreated (and herein lies the test of its proper use), the rats pass over the mixture which adheres to the skin, corrodes it, and also causes death by internal complications, owing to the animal trying to clean itself with its mouth. As a rat killer it is but moderately successful and, for this reason, the splendid protective powers of this mixture are often ignored by disappointed experimenters. To protect houses that have been newly disinfected or prevent invasion of dwellings in the midst of an infected area by infected rats, or to form a protective band in an infected town *within a healthy area* is, I think the role that this preparation best fulfils. Two commonly advertised rat poisons have been used with benefit.

A considerable quantity of Danyez virus was obtained from Europe. The experiments with it in the King Institute by Lieutenant Christophers showed that death of individual rats known to have eaten the virus could be accomplished, and therefore so far its action was in no way superior to the use of an ordinary rat-poison.

Possibly, the animal room of a laboratory was hardly a suitable place to conduct the experiments—presumably, the removal of excretions of the animals and absence of cannibalism did not aid general infection. Evidently search for other rat diseases is requisite. There are other general infective diseases available as shown by the history of the Bristol microbe.

Whilst believing that the mere diffusion of heat in a room must be a most untrustworthy method of conducting disinfection—so called 'desiccation'—it has always seemed to me possible that the direct application to surfaces of a powerful blue flame on the principle of the kerosene brazing lamp would be of utility. My own small bacteriological experiments on the subject in 1899, however, showed that it could not compete in expenditure of time with the use of acid perchloride of mercury solutions. Still there are many conditions, such as disinfection in a wet or cold climate, where the use of dry heat would be an alternative that would be much appreciated by the people. A powerful 'Local heater' was therefore procured, with the sanction of Government, and experiments have been made by Lieutenant Christophers, I.M.S. His experiments show that actual sterility can be secured of the floor of a shed in which cattle had at times been kept consisting of dried mud and which had been roughly swept, provided the exposure of ten seconds could be afforded and that this sterility extended to 2 m m. In treating cowdung floors, he found that by going twice over the surface (each time for a duration of ten seconds) he secured 'almost if not quite complete sterilization to a depth of 4 to 5 m m—a condition he considers, it is probable would be difficult to effect by means of fluid disinfectants, taking into consideration the extremely refractory nature of the material one is dealing with'. On the whole, therefore, for application under special conditions, there seems reason to believe that the direct application of the 'kerosene blue flame' has a sphere of utility, and that it is quite worth while to go further into methods and means of application of heat in this manner.

The attention of those interested in septic tanks is directed to the quotation we make in another column from Colonel King's report.

IV - ASSAM

The year 1904 was on the whole a healthy year. The birth rate was 35.5, and the following table contrasts the birth rates of the various provinces in India for the past 6 years—

BIRTHS REGISTERED

Province	1898-1902	1903	1904
	Birth rate	Birth rate	Birth rate
Assam	32.90	35.77	35.55
Bengal	38.17	39.00	42.59
Central Provinces	37.18	45.11	53.19
Madras	28.8	31.30	40.7
Burma	34.38	33.54	32.71
Bombay	30.72	31.22	35.09
United Provinces	42.60	46.13	46.67
Punjab	40.70	42.91	41.5
North Western Frontier Province	31.3	31.56	34.93

The following are the death rates—

DEATHS REGISTERED

Province	1898-1902	1903	1904
	Death rate	Death rate	Death rate
Assam	30.16	26.55	25.85
Bengal	30.92	33.33	32.45
Central Provinces	33.30	35.52	32.06
Madras	20.4	22.20	22.5
Burma	24.48	24.13	22.36
Bombay	42.22	43.91	41.39
United Provinces	30.91	40.28	34.70
Punjab	36.07	49.01	49.1
North Western Frontier Province	23.3	28.40	28.56

The following table which gives the mortality for male and female infants, calculated on the registered number of births for one year, and on the census population under one year of age is instructive and interesting —

Province	1904		
	Male	Female	Both sexes
Assam	200 50	193 36	197 05
Bengal	194 94	177 81	186 54
Central Provinces	224 79	205 49	215 40
Madras	192 8	173 2	181 2
Burma	214 82	166 45	191 50
Bombay	201 63	186 87	194 54
United Provinces	227 31	225 92	226 64
Punjab	224	229	226
North Western Frontier Province	202 89	171 53	187 23

Cholera — There was a decrease, the mortality ratio being lower than that of the decennium

The small-pox mortality is higher, but some of this may be due to measles, as small pox is locally known as 'at' and measles as 'horu ai' (i.e. little ai). Considering the terrible epidemic of measles in 1903 in the United Provinces, it is strange that we have not heard more of a prevalence of measles in other parts of India

As might be expected much attention was paid to *Tala*, *azai*, and Leishman Donovan infection, but the former disease though prevalent in many parts of Assam is no longer markedly epidemic, but is scattered about in the form of chronic or less strongly marked cases, or of isolated cases of a more acute type

The Civil Surgeon of Lakimpur thinks that ankylostomiasis is more common in tea garden than among the general population, and that the dysentery so frequent found is a terminal sign or mode of dying in ankylostomiasis. A note is given on Cancer in Assam. It appears that the dispensaries only returned 59 cases, i.e. 31 carcinoma and 25 sarcoma, presumably in one year

THE REPORT OF THE MADRAS GENERAL HOSPITAL

As usual the Report of this hospital is most interesting and valuable and shows how much is lost by the non publication of the reports of the sister Hospitals in Calcutta and Bombay, Major G. G. Gifford, I.M.S., submits the report of the First Surgeon's Wards from which we quote the following interesting cases —

"Although there have been 657 operations as compared with 773 of last year and an average of 669 during the past five years, there have been few of great individual interest. It is always said that the more remote results of surgical operations cannot, for various reasons, be traced in India. I have long doubted whether this statement was true. I have therefore decided to make an organised and systematic attempt to follow all cases of sufficient interest. I have therefore started a system by which a selected patient is supplied with a form printed in English and the three principal vernaculars of the Presidency, which I ask him to take the trouble of filling in for himself and return, and if illiterate, to get it filled in by the nearest person who can write

This form asks three simple questions —

- (1) Is the patient alive?
- (2) Is he satisfied with the result of the operation?
- (3) Has there been any recurrence?

So far out of twenty forms issued ten have reported. I consider this a fair result as of the ten not reporting four have probably died. I am satisfied that if the Surgeon will only take the trouble, in this Presidency with its numbers of officials from Revenue Inspectors, and Police up to Collectors, it is almost impossible to imagine a person being permanently lost sight of. I supply the patients with stamped addressed envelopes so that the trouble to them is infinitesimal

One of the more satisfactory advances in treatment this year has been the complete and rapid cure of two cases of infective granuloma by means of daily ten minutes' exposure to the X rays. An ultra violet ray lamp has been indented for, and I hope that it may prove even more efficient for the treatment of this complaint than X rays. It is still difficult

to treat those cases of this distressing and ill understood complaint that occur in the rectum, mouth or vagina, but I have hopes of being able to record next year an advance in the treatment of these cases. One case of a very large rodent ulcer covering the whole of one side of the nose and a portion of the face has also been cured by this means

The following cases are of interest —

(1) A very stout Hindu gentleman came up to Madras from the West Coast suffering from elephantiasis of the right leg and deep pain of obscure origin in the upper part of the right thigh and right hip joint with a temperature varying from normal to 101. All the ordinary remedies having failed to give relief I decided, on consultation with the Senior Medical Officer, to cut down on the great trochanter, which was the most tender spot and open the bone. The bone was opened for some four inches with a chisel and found full of yellow tubercle. This was scraped away with a spoon, but the limit of the disease could not be reached and as the skin incision was already a foot long and six inches deep, it did not seem right to do any more at that time. The wound healed perfectly, but the pain continued and as the leg had been quite useless for seven years, it now became a question of amputation at the hip joint. An attempt was made for some ten days to reduce the man's weight but the thyroid extract that was given disturbed the circulation so greatly, without affecting the weight that it had to be given up. The risks of immediate death from shock was carefully explained to the patient and weighed against the misery of his present condition, with his consent I amputated the leg by Esmarch's method at the hip joint. It was the most butcher like and meaty operation I have ever done or seen but only took twenty minutes to complete. The acetabulum was found diseased and ulcerated and was scraped and a gauze drain left in. The remainder of the mass of fat that constituted the stump was sewn together with stout fishing gut sutures deeply inserted. After some twelve hours of great shock and rapid pulse, at times amounting to pulselessness, the patient made a good recovery and all the huge stump healed by first intention. The man still weighs 195 lbs. The leg during life must have weighed some fifty pounds

(2) An European Sergeant who had been through the South African War had been in a Bangalore Hospital for some months suffering from liver abscess which had been successfully operated on and the wound of which operation had not yet completely healed. He came down here very collapsed after the railway journey and the right side of the chest was found to be full of pus up to the level of the fourth rib. Stimulants and careful nursing for two days revived him sufficiently to make the operation rather less certain of a fatal ending. I removed two inches of the eighth rib in the post axillary line. Plugging the wound in the pleura with a finger and allowing the patient to partly come round from chloroform, the pus was slowly allowed to flow out and the chest remained in a condition of complete pneumothorax. After shock had passed off the patient's condition slowly began to improve and I then hoped that I should be able to get him (in a few months perhaps) strong enough to justify an extensive thoracoplasty. To my surprise, however, the lung expanded, the liver and diaphragm rose about 1½ inches and the wound healed (with good if rather harsh breath sounds in the chest) perfectly and the patient got positively fat in five or six weeks

We quote the following cases from Major D. Simpson's report on the Second Surgeon's Wards —

"Renal cases — Nephrotomy was performed in two cases with very marked neurotic symptoms. One patient was a European, the other a native. I have considerable doubt as to the benefit likely to accrue from operation in these cases, Jacobson for one, not being in favour of operation in such instances. These, however, showed distinct benefit from the operation and were markedly relieved of their nervous symptoms

One case of Nephrotomy on an Eurasian woman is interesting inasmuch as in the left kidney it presented all the symptoms of renal calculus with the accompanying shooting pain, and with albumen and casts in the urine. Attacks had been recurring at intervals for the previous twelve years. On cutting down upon the kidney nothing was found abnormal except some congestion. The kidney was incised along the convex border and the pelvis found free of any foreign matter. The wound healed readily and the patient was free of the particular pain complained of from that time. She returned however, to hospital ten months afterwards, complaining of frequent loose and scanty motions, and a dull aching pain in her left iliac region and pain about the anus. On digital examination there was found to be stricture of the rectum high up and a hard mass could just be felt which could only be regarded as cancerous disease of the rectum. It was high up in the bowel and patient would not hear of any operative treatment

"Intestinal cases — Excision of Cecum — This was a case of long standing fever in a native woman of 18 years of age

accompanied by abdominal pain, specially marked in the right iliac region, along with nausea and vomiting. There was a painful swelling in the right iliac fossa, about 3 inches in length and an inch in width, and extending into the hypogastric region. The attacks of pain came on several times a day and had been going on for three months, but patient had been ill for a year and was much reduced, being unable to take food without subsequent nausea and vomiting. The general appearance and local examination tended towards a diagnosis of tuberculous disease involving the cecum with enlargement of glands. The abdomen was opened by an incision along the lower part of the linea semilunaris, and a mass as large as a mango was found involving the cecum along with an aggregation of tubercular glands. The mass was excised and the ilium united to the ascending colon by end to end anastomosis with continuous and Lembert sutures. This was possible owing to there being not much difference in calibre between the two ends of bowel. The wall of the excised portion was greatly thickened and the ileocecal valve so constricted as only to admit an ordinary pencil. The disease was found to be entirely tuberculous. The after progress of the case was good, except for some amount of trouble with the abdominal wall at the lower part of the incision, as all the tubercular glands in the neighbourhood of Poupart's ligament could not be completely removed, and a consequent sinus remained for some time. The patient was relieved of all her gastric and intestinal trouble.

Gastro Jejunostomy—This was the case of an emaciated woman with haggard expression and history of long standing pain over the stomach, especially over the cardiac end. The patient had great gastric trouble, vomiting taking place regularly after food in about fifteen minutes' time. The case was diagnosed as probably cancerous disease of the stomach. On opening the abdomen between the ensiform cartilage and the umbilicus, the stomach was found to be considerably dilated but otherwise healthy. The duodenum appeared also free of disease, but the first portion of the jejunum for about 10 to 12 inches had several constrictions in its calibre with roughened puckered external appearance, which were undoubtedly causing the gastric symptoms by obstruction to the passage of food. The early onset of vomiting so soon after food, considering that site of obstruction was beyond the duodenum, was rather misleading. A median incision was made and posterior gastro jejunostomy performed with continuous silk suturing followed by Lambert uniting the upper part of the ilium, just below the constrictions to the posterior aspect of the stomach, but not carrying the loop of ilium through the mesocolon which was considerably thickened. The case made an excellent recovery, the wound healed quickly, and the patient put on flesh with great rapidity, losing all the wretched character of expression. The cause of the constrictions could not be determined, though they were evidently not malignant.

The following statistics will show the amount and nature of the work done in the wards of the Third Surgeon by Capt W J Niblock, I M S—

"Amongst the most important operations performed during the year were—

Radical cure of hernia	{	reducible inguinal	43, all cured
		irreducible	4, "

The operation consisted in most cases in fastening the proximal portion of the sac above and external to internal abdominal ring underneath the transversalis fascia, removing omentum when present in the sac, and where necessary suturing the internal oblique and transversalis fibres to Poupart's ligament over the cord.

Ventral hernia	1, cured
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This hernia was the result of a perforating wound received five years before. The protrusion was the size of a large mango and situated just above the internal abdominal ring. The operation consisted in complete obliteration of the sac and suturing of the abdominal muscles in layers.

Strangulated inguinal hernia	11, 7 deaths
Elephantiasis of scrotum	29, all cured

I have now performed the operation for removal of elephantiasis of the scrotum 146 times without a death, showing the comparative safety of the modern operation. Many of the cases were complicated with hernia, urinary fistula, etc.

Vesical calculus	1, cured
Major amputations	24, 2 deaths
Operations on bones	29, no deaths
Amputation of penis (complete)—	
(a) For carcinoma	11, 1 death
(b) For cicatrizing granuloma	2, cured
Stricture of urethra and urinary fistula	37, 1 death
Carbuncle (excision)	21, 2 deaths (both diabetic cases)

Empyema

Hepatic abscesses—Twelve operations—

Single	7, 2 died	One of the patients who recovered was a Eurasian pensioner aged over 70
Multiple	4, all died	
Probably multiple	1, died	

No *post mortem* examination was made in this last case, but the clinical appearances pointed to the likelihood of the abscess being multiple. One of the abscesses had burst through the abdominal wall prior to the patient's admission to hospital.

Appendicitis—There were six operations for appendicitis, in four of which the appendix was removed. The other two were cases of large appendicular abscesses in which the appendix could not have been found without distinct risk. All the cases recovered.

One of the cases was of interest in that the inflamed appendix was situated in the sac of an inguinal hernia.

Capt T H Symons, I M S, has the following remarks on typhoid fever as seen in the wards of the Fourth Physician—

"Typhoid Fever"—Seventeen cases were treated during the year with one death. In the majority of these Vidal's reaction was positive. I would like to point out the difficulty in diagnosing enteric cases when the symptoms and physical signs are not marked, from Donovan's proplasmosis. In the light of past experience I am sure many typhoid cases, so called, are really of the nature of proplasmosis. I have a case in my wards at the present moment. He lived in a hostel and with a companion was admitted into the hospital for enteric fever. The companion had a typical enteric attack, intestinal hæmorrhage, etc., and recovered. The other case, after having gone through what was apparently a normal attack of typhoid, and having had an interval of 17 days' normal temperature, developed a very irregular fever with a palpable and very tender spleen. Vidal in the hæmorrhage case was positive and in the other negative. The spleen has not been punctured. The case is still in hospital and time alone will clear the diagnosis, but at present, I am inclined to think the two cases are different, although admitted from the same hostel within a few days of each other.

Last year the American physicians brought to our notice the great probability of the respiratory tract being the seat of invasion as well as the alimentary canal, in other words that enteric fever is air borne as well as water borne. I have taken particular note of this fact and cannot help thinking there is a great deal in it. We knew before that bronchitis was so common a complication in typhoid, that practical physicians were inclined to regard it rather as a symptom than a complication. I might say that all the cases I have seen during the past year had bronchitis more or less marked. In some cases, it was because of this trouble the patient came to the hospital and no mention was made of any bowel trouble. Another point, constipation is, I think, almost the rule, and not the exception amongst these cases in Madras. Just the opposite to what one is taught and what one reads in text-books. Now I take it that diarrhoea or constipation depends upon the amount of intestinal inflammation. If there be little or no inflammation in Peyer's Patches, then there is no reason why diarrhoea should occur. I suppose all will admit that when marked changes do occur in Peyer's Patches, they are the result of the typhoid bacillus invading the human organism at this point. If this be so, why should not those cases in which we have marked excess in the bronchial secretion and none in the alimentary system be a sign that the primary invasion has taken place through the air passages and not through the alimentary canal. When one thinks of the conservancy arrangements in India, the respiratory method of invasion will appear more feasible than the water borne method. With clouds of dust which one experiences in Madras, it is easy to understand how the typhoid bacillus can be conveyed to the susceptible person. In the treatment I have adopted only the expectant method and I fail to see the rationale of pouring antiseptics *ad nauseam* into the alimentary, when the typhoid bacillus we know is circulating throughout the system and may not even have invaded the alimentary canal at all. Again is it always advisable to attempt to antisepticise the intestinal contents, even if we could by the administration of such drugs, a fact I very much doubt?

The case that died was interesting in that the real condition was not diagnosed until the bowel perforated. The patient, a boy aged 14, had no signs of the disease and was only suffering from an irregular temperature which was thought to be due to proplasmosis.

*What are here called 'proplasmosis' are cases of Leishman Donovan infection, for which we have not yet got an altogether satisfactory name.—Ed. J. W. G.

It would be a task of great labour to work out such statistics to cover the 140 years which have elapsed since the I M S was first definitely founded, on 1st January 1764. And the figures, when worked out, would be subject to several fallacies. First, as regards the men serving in the 18th century, it would now be impossible to trace out what became of all of them, of many only the names survive, even in the MIS records of the India Office. Second, a century ago there were no age limits to service, a man might serve on to an hundred, if he could keep himself alive so long. Many officers settled permanently in India, entirely resigning all idea of returning to Europe. These men were bound to die sooner or later, and so came under the head of deaths, instead of retirements, as they would do under modern conditions. Third, the conditions of service in India have altogether changed. Not only do we live a much more healthy life than our great grand fathers did, but the increased facility of communications and the ease of access to the hills or to England, have materially altered the conditions of life in India, and from a health point of view altogether for the better. Even as regards the service of little over half a century ago, the mutiny caused a mortality altogether abnormal.

I have therefore begun with the year 1865, when the I M S was thrown open to competition again, after being closed for five years. The following table gives the results as regards death and retirement of the men who have entered the Bengal Medical Service from 1st April 1865, when it was reopened to the end of September 1905, a period of a little over 40 years. As the Bengal service came to an end, as regards new admissions in 1890, the statistics include the results for the men of 32 years, of whom the last have now nearly ten years service, during a period of 40½ years.

THE BENGAL MEDICAL SERVICE, 1865 1905

	Retired	Resigned	Died	Serving	Total	REMARKS
0—5 years		3(a)	29		37 (a)	Includes one dismissed and one deserted
5—10 "	5	7	27	11	50	
10—17 "	7		24	94(b)	125 (b)	Exclusive of two on temporary half pay
17—20 "	12		12	60	84	
20—25 "	35		10	28	76	
25—30 "	63		5	35	109	
Over 30 "	24		1	12	37	
After total as A M O	17				17	
Total	172	15	108	240	535	

Among the deaths are included fifteen cases of violent death, viz, two killed on active service, one murdered, seven killed by accident, and five cases of suicide. I was at first doubtful whether these fifteen cases should be included among the deaths not being in any way due to climatic causes. However, given a sufficiently large number of men, such cases are bound to occur, they have therefore been included in the general table not separately shown. All but two of them occurred in early years of their service, of the seven men killed by the accident, three met their deaths by falls from horses (one going over a *khud* in the hills with his horse), two were killed by chemical explosions, one by a tiger, and one at polo.

Obviously the twenty five years pension has been for the most popular. It is worthy of note that a large number of the men who retired on their pension were not far off from completing their time for the thirty years pension. To the twenty four who retired on the thirty years pension should, of course, be added, the seventeen who retired after serving a tour as Administrative Medical Officers. Of these seventeen officers all are living except one. Only one officer, the late Surgeon General Harvey, has died during his tour of administrative office, two have retired soon after promotion, one of them, who died a few months later on account of ill health.

The twelve men who are shown as having *retired* with between five and seventeen years service, all presumably, went on account of ill health, most of them, I believe, are dead, though two at least, are still living and practising at home twenty years later.

One officer died after leaving Netley, before embarking for India. He is included among the deaths from under five years. Four others resigned, without ever joining the service, they are not included in the tables.

The fifteen who resigned did so, in most cases, at least, for reasons unconnected with their health. One of them was dismissed, over twenty five years ago, and another, nearly twenty years ago, chose to leave the service by deserting, he was afterwards gazetted as 'suspended for absence without leave'.

The small number of men who die in the later years of service, of course, due to the fact that men, entitled to pensions, usually take them rather than serve on in ill-health.

The following notice has been circulated, and is one with which we have much sympathy. 'We have the pleasure to inform you that a Provisional Committee with power to add to its number has been formed to raise and collect subscription for the purpose of erecting a Memorial in the Calcutta Medical College, in honour of Surgeon General G. Bomford, M.D., C.B., I.M.S., who was Principal of the College for ten years, and who has recently departed from our midst to fill the office of Director General of the Indian Medical Service.

It is needless to make any attempt here to enumerate the many virtues and attainments of Surgeon General Bomford. His genial disposition, his affable manners and his unvarying courtesy rendered him accessible to all, and his high character commanded the respect and admiration of all who had occasion to come into contact with him. He was a great friend of the Medical Student, he always sympathised with their difficulties and troubles and was ever ready to listen to their grievances and wants, and to remedy them when they were just.

His one object during his tenure of office as Principal of the Calcutta Medical College was to improve the status of the College, and he devoted his whole time to accomplish this object. He had a large share in the conception of the great improvements that we see in the various departments of the College at the present time. The new Physiological and Bacteriological Laboratory which has been fitted with all recent appliances and which now gives to the students ample facilities for practical work owes its origin and completion entirely to Surgeon General Bomford. The new Surgical Block which is under construction also bears testimony to his earnest desire to improve the resources and raise the prestige of the Calcutta Medical College.

We appeal to the many friends, admirers and students of Surgeon General Bomford to help us in perpetuating his memory in a befitting manner in grateful remembrance of his valuable services to the Calcutta Medical College and to the cause of Medical education in Bengal. The shape and form of the Memorial will be decided by the subscribers at their meeting to be held at a suitable date later on.

It gives us very great pleasure to announce that Col. C. P. Lukis, M.D., I.M.S., the present Principal of the College, has kindly agreed to act as President of the Memorial Committee.

Subscriptions will be thankfully received and acknowledged by

ASST. SURGEON—SURESWAR SARKAR,

House Physician, Medical College Hospital.

ASST. SURGEON—SATIS CH. DAS,

House Surgeon, Eden Hospital.

We remain,

SIR,

Yours faithfully,

KAILAS CHUNDRA BOSE

UPENDRA NATH BRAHMA

DEVENDRA NATH ROY

CHARL

BEHARI LAL CHAKRAVARTI

HIRA LAL BASU

CHUNI LAL BOSE

SURENDRA NATH GHOSH

KEDAR NATH DAS

SURESWAR SARKAR

SATIS CHANDRA DAS

The following will interest officers, I S M Dept —

PENSIONS—WIDOWS AND ORPHANS — With the approval of the Right Honble the Secretary of State for India, the Government of India have been pleased to sanction the introduction of the following modifications, which are based on the analogy of the orders in the regulations governing the grant of pensions to the families of departmental officers with honorary rank and warrant officers of the Indian Service.

2. In future—

(i) the family of a departmental officer with honorary rank shall be eligible for —

(a) highest pension (with gratuity) if the officer was killed in action, or dies from wounds received in action within two years from date of being wounded.

Definitions—Highest pension means —

Widow, twice the ordinary rate of pension.

Each child, fifty per cent more than the ordinary rate of pension.

The ordinary rates are those tabulated in Army Regulations, India, Volume 1, Part 1, Article 1635.

The gratuity referred to above is of 12 months' pay for the widow plus one third of a year's pay for each child, computed according to the scale given in Article 1634, Army Regulations, India, Volume I Part I

(b) 'Intermediate' pension (without gratuity) if the officer dies of disease or illness contracted on active service in the field, or of wounds or injuries received in the execution of military duty otherwise than in action, within two years from date of sustaining the wound or injury or of removal from duty on account of the illness or disease

The title to the 'intermediate' rate of pension in cases as above is determined generally by the conditions (other than the time limit) laid down at B in Article 642, Royal Warrant Pay and Promotion 1900

Definition—'Intermediate pension' means—

Widow, fifty per cent more than the ordinary rate of pension

Each child, twenty five per cent more than the ordinary rate of pension

(i) the family of a warrant officer shall be eligible for the 'intermediate' pension (without gratuity) where the warrant officer dies within two years of wounds received in the execution of military duty otherwise than in action [A similar grant in cases where the warrant officer dies of disease contracted on active service within two years from date of removal from duty on account of such disease, has already been sanctioned.]

At a meeting of the past and present students of Anatomy, Calcutta Medical College held in the Overtown Hall on Monday, the 3rd ultimo, retired Assistant Surgeon Behari Lal Chakrabarti in the chair, it was resolved that a suitable memorial, preferably a bust, be erected in the Anatomical Buildings to perpetuate the memory of Lieut.-Col R. H. Charles, M.D., F.R.C.S.I., who has just vacated the chair of Anatomy

A committee to raise subscriptions was elected, consisting of 14 members from the College staff, Campbell Medical School staff, private practitioners, lady students, civil and military students, with the undersigned as Secretary, and Messrs Whiteaway, Laird & Co as Bankers

All contributions from past and present students of Anatomy and admirers of Dr Charles may be sent to Assistant Surgeon Hira Lal Basu, 25-5, Mott's Lane, Calcutta

On the 1st October Colonel P H Benson assumed charge as Principal Medical Officer, Bangalore and Southern Brigades, Colonel T J Hackett-Wilkins as P.M.O. of the Burma Division, and Colonel A. F. Dobson as P.M.O. of the Secunderabad Division

36th Jacob's Horse—Captain R. M. Carter, I.M.S., Medical Officer, 116th Mahrattas, to the medical charge, *vice* Major E. G. R. Whitcombe, I.M.S., transferred

102nd Prince of Wales's Own Grenadiers—Lieutenant G. F. I. Harkness, I.M.S., to the officiating medical charge, *vice* Captain G. McPherson, I.M.S., transferred to the Civil Department, temporarily

116th Mahrattas—Major E. G. R. Whitcombe, I.M.S., Medical Officer, 36th Jacob's Horse, to the medical charge, *vice* Captain R. M. Carter, I.M.S., transferred

LIEUTENANT R. F. STEEL, I.M.S., to the officiating medical charge, *vice* Major E. G. R. Whitcombe, I.M.S., granted leave

128th Pioneers—Lieutenant J. L. Lunham, I.M.S., to the officiating medical charge, *vice* Captain A. G. Sargent, I.M.S., transferred to the Civil Department, temporarily

130th Beluchis—Lieutenant W. T. McCowen, I.M.S., to the officiating medical charge, *vice* Captain C. O. Murison, I.M.S., transferred to the Civil Department, temporarily

CAPTAIN L. B. SCOTT, I.M.S., has obtained an extension of leave "for study" for three months

REWARDS—GOOD CONDUCT AND MERITORIOUS SERVICE.—The Government of India have sanctioned the grant of good conduct and meritorious service medals, under the general rules governing the grant of these rewards to the Native Army, on the following scale to Native soldiers seconded for service with the Army Bearer Corps—

(1) *Meritorious Service medal, with an annuity of Rs 25.*—One medal with annuity to be awarded among all the pay-havildars serving with the Army Bearer

Corps, the annuity to cease on the reversion of a pay havildar to a regiment, the medal being retained

(2) *Long service and good conduct medal, with a gratuity of Rs 25*—One medal every five years to be awarded among all the pay havildars serving with the Army Bearer Corps

CAPTAIN R. E. LLOYD I.M.S., is appointed Surgeon Naturalist, Indian Marine Survey, *vice* Captain McGilchrist, I.M.S., who has gone to Eastern Bengal in civil employ

LIEUTENANT COLONEL O. P. LUKIS, M.D., F.R.C.S., Principal of the Medical College, Calcutta, is appointed also to be Medical Officer, 1st Calcutta Volunteers

CAPTAIN MCCAY, I.M.S., and Captain J. W. Megaw, I.M.S., are gazetted as Lieutenants in 1st Calcutta Volunteers

LIEUTENANT COLONEL C. L. SWAINE, I.M.S., Civil Surgeon, Nagpur, has been allowed combined leave for one year, seven months and eleven days from 11th September 1905, or subsequent date

CAPTAIN G. MURPHY, L.S.M.D., Civil Surgeon, Narsingpur, has been allowed three weeks' privilege leave

LIEUTENANT COLONEL J. E. MARSDEN, I.M.S., was due from furlough on 3rd October

MAJOR R. ROBERTSON, I.M.S., is due from furlough on 7th November 1905, 89 days of his leave has been converted into study leave

MAJOR P. C. GABBETT, I.M.S., is due out from leave on 14th November 1905

CAPTAIN T. H. FOULKES, I.M.S., who was due from leave on 3rd October, had 5 months and 26 days of it as study leave

CAPTAIN C. G. WEBSTER, I.M.S., due out on 22nd October 1905, had six months and 12 days of his leave converted into study leave

CAPTAIN P. P. ATAL, I.M.S., Civil Surgeon of Cochin, has been on cholera duty in Madras

The combined leave of Captain W. H. Tucker, I.M.S., will expire on 18th January 1906

CAPTAIN E. W. BROWNE, I.M.S., arrived on 19th August 1905 from Aden for civil employ, Madras

LIEUTENANT G. W. O. BRADFIELD, I.M.S., was posted to Madras on cholera duty

MAJOR A. W. T. BUIST, I.M.S., went on privilege leave for one month on 28th August, and Captain G. O. L. Kernans, I.M.S., officiated for him, in addition to his military duties

MAJOR HENRY SMITH, I.M.S., returned from privilege leave to Jullundur on 28th August.

LIEUTENANT COLONEL G. A. EMERSON, I.M.S., held additional charge of Ballia District during the absence on leave of Babu Manna Lal

MAJOR E. JENNINGS, I.M.S., Superintendent of the Central Jail, Bareilly, obtained 15 days' privilege leave

LIEUTENANT J. O'LEARY, I.M.S., is appointed to the medical charge, *sub pro tem*, of 4th Cavalry

LIEUTENANT J. A. BURGESS, I.M.S., is posted to the officiating medical charge of 7th Rajputs.

LIEUTENANT COLONEL CAERUTHERS, I.M.S., has been deputed to inspect and report on the medical store depôts in India.

LIEUTENANT COLONEL SWENY, I M S, on his return from furlough, returns to Benares as Civil Surgeon

MAJOR W H ORR, I M S, Civil Surgeon, U P, has got 18 months' combined leave

INCOME TAX—The Government of India have decided that income tax should not be levied on a war gratuity, the cost of which is borne by Indian Revenue, when paid to an officer, who, apart from the receipt of the gratuity, would not be liable to the tax

2 This ruling is applicable to the gratuity sanctioned for the Tibet Mission Escort

THE services of the undermentioned officers are placed temporarily at the disposal of the Government of Bombay —
Captain G McPherson, M B, I M S
Captain E F G Tuoker, I M S
Captain C. C. Murison I M S

LIEUTENANT COLONEL R R H WHITWELL, I M S, has been permitted to retire from the service from 17th September 1905. Lieutenant-Colonel Whitwell entered the service on 1st March 1880, in the same batch as C P Lukis, L A Waddell, the late G Money Shevan, D B Spencer, the late James Clarke, C C Vaid, P Durrell Pank, T R. Mulroney, and T R. Macdonald, in the Bengal Service, R. H. Cama, W B Browning, F R Divecha, C M Thompson, C S Rundle and J Evans, in Madras, and H P Dimmock and the late C B. Maitland in Madras

He served most of his time as Civil Surgeon in Bengal and chiefly in Bihar. He paid special attention to diseases of the throat and to brain diseases. He is a thorough sportsman and his friends in Bihar will wish him many days to come in his retirement. He had no war service.

CAPTAIN V H BENNETT, I M S, now at home on leave has been granted an extension of furlough up to 17th February 1906

CAPTAIN W S PATTON, I M S, acted for some time and afterwards Lieutenant W S J Shaw, I M S, as Medical Officer to the Kathiawar Political Agency in August last.

CAPTAIN L E GILBERT I M S, was permitted to return to duty, to Burma, within the period of his leave, and was posted as Civil Surgeon of Akyab

MAJOR A R P RUSSELL, I M S, has received one year's combined leave

CAPTAIN T STODART, I M S, was granted seven months' combined leave

CAPTAIN C J. ROBERTSON MILNE, I M S, Acting-Superintendent, Lahore Lunatic Asylum, got one month's privilege leave from 1st August.

MILITARY ASSISTANT SURGEON FLEMING acted as Superintendent of the Asylum, *vice* Captain Robertson Milne I M S.

CAPTAIN D H F COWAN, I M S, returned to Karnal as Civil Surgeon, from privilege leave on 27th August

LIEUTENANT W J COLLINSON, I M S, returned from the Kangra Valley, to plague duty, Amballa, on 6th July

CAPTAIN G MCCALL, L S M D, got two months' extension of leave

CAPTAIN G HUTCHISON, I M S, is appointed a Civil Surgeon, sub-*pro tem*, 2nd Class

CAPTAIN T HUNTER, I M S, is appointed a Civil Surgeon, 2nd Class, sub-*pro tem*

LIEUTENANT COLONEL C O MANIFOLD, I M S, has returned to civil employ in the United Provinces

THE Right Hon'ble the Secretary of State for India has intimated that arrangements will, in future, be made for a telegram to be sent to the Government of India advising the grant of extensions of leave on medical certificate to officers

in cases where the information is not likely to reach India by post before the expiration of the original leave

WITH effect from 19th May 1905, Captain W H Kenrick, I M S, and Captain P K Chitale, I M S, are confirmed as Civil Surgeons, C P

ON return from privilege leave Captain V E Lindesay, I M S, goes as Civil Surgeon to Motihari

MAJOR CROFT STEVENS, M.D., F.R.C.S., has gone to Cuttack as Civil Surgeon and Superintendent of the Medical School

MAJOR B OLDHAM, I M S, has gone to Patna as Civil Surgeon, *vice* Lieutenant-Colonel R. H. Whitwell, I M S, retired

WITH the approval of the Right Hon'ble the Secretary of State for India it is notified that officers of the Indian Army serving at Colonial Stations may be permitted to take combined leave during such period of the year as may be most suitable to local conditions

MAJOR J K CLOSE, M D, I M S, Civil Surgeon of Benares, on relief by Lieutenant-Colonel Sweeny, I M S, has gone on combined leave for one year

MAJOR H SMITH, I M S, resumed charge of the Jullundur Jail on 28th August 1905

CAPTAIN G C L. KERNANS, I M S, took charge of the Multan District Jail from Major Buist, I M S, on 28th August

CAPTAIN D H F COWAN, I M S, took over charge of the Karnal District Jail on 28th August 1905

LIEUTENANT O L DUNN, I M S, Assistant Plague Medical Officer, Shapur, got privilege leave for two months and 12 days from 7th August, including one month's Tibet leave

CAPTAIN T S NOVIS, I M S, acts as Professor of Anatomy, Bombay, during the absence on leave of Major Ashton Smith, F.R.C.S., I M S

CAPTAIN C C MURISON, I M S, is appointed Acting Civil Surgeon of Sukkur, Captain C R Bakhale, I M S, as Civil Surgeon of Bijapur, and Captain E F Gordon-Tucker, I M S, as Civil Surgeon of Surat.

MAJOR C T HUDSON, I M S, on return to duty, goes to Nasik as Civil Surgeon

MAJOR ASHTON SMITH, F.R.C.S., is granted one year's combined leave.

LIEUTENANT M WINDROSS, L S M D, is appointed Officiating Civil Surgeon of Bhandara, C P

THE new regulations for the American Army Medical School are published in the Journal of Military Surgeons, for September 1905

CAPTAIN P DEE, I M S, was granted study leave from 15th February to 17th July, and also two months' extension of leave

COLONEL D WILKIE, I M S, has been appointed the first Inspector General of the new Province of Eastern Bengal and Assam and Lieutenant-Colonel Weir, for many years Superintendent of the Fatehgarh Central Jail, has become Inspector General of Prisons in the same Province

ON return from furlough Lieutenant-Colonel R. Cobb, I M S, is posted as Civil Surgeon of Midnapore

CAPTAIN MACGILCHRIST I M S, who has been acting as Civil Surgeon of Midnapore, is posted to Jalpaiguri as Civil Surgeon

RAI SAHIB BHAGWAN DAS was granted six weeks' privilege leave from 4th September, and Senior Assistant-Surgeon Atai Oland acted as Civil Surgeon of Ludhiana.

THE following is the text of the Government of India Resolution on the Revised Rates of Pay for the Jail Department (dated Simla, 28th September 1905) to which we have referred above —

1 In paragraph 2 of the Home Department Resolution Nos 361-75 dated the 17th April 1905 which announced the decision to increase the emoluments of officers of the Indian Medical Service in civil employ, the Government of India stated that orders regarding the pay of appointments in the Jail Department held by officers of that service would be issued later on

2 The Government of India have now received the final orders of the Secretary of State on this subject and are pleased to notify that the following scale of consolidated pay has been sanctioned for officers of the Indian Medical Service employed in the Jail Department —

Inspector General of Prisons	Madras	Rs		Rs
		1800-50	-2000	
	Bombay	1800-50	-2000	
	Bengal	2,000		
	United Provinces	1800-50	-2000	
	Punjab	1800		
	Burma	1,800		
	Central Provinces and Berar	1500		
		Superintendent, 1st Class Jail	Superintendent, 2nd Class Central Jail	
		Rs	Rs	
Lieutenant Colonel (specially selected for increased pay)		1,550	1,450	
Lieutenant-Colonel after 25 years' service		1,450	1,350	
Lieutenant-Colonel		1,400	1,300	
Major after 3 years' service		1,050	950	
Major		950	850	
Captain after 10 years' service		850	750	
" " 7 " "		800	700	
" " 5 " "		750	650	
Captain		700	600	
Lieutenant		650	550	

The Secretary of State has further decided —

- (1) that the scale will take effect from the 1st April 1904
- (2) that officers already in the department may choose between the existing and the new scale also with retrospective effect,
- (3) that when the present pay of officers choosing the new scale is in excess of that therein laid down, they may continue to draw their present salary until they become entitled to an increase under the new scale

THE newly published regulations for study leave for I.M.S. officers will appear in our next issue

THERAPEUTIC NOTES AND NOTICES

WATER-STERILIZING TABLETS

MESSRS SMITH STANISTREET & Co, Calcutta, have put on the market admirably got up, the water sterilizing tablets, invented by Lieutenant Nesfield I.M.S. as detailed in his papers in our issues for July and August 1905

The method is simple, one of the tablets in the "A" tube and one of the "B" tablets is placed in an empty cup or vessel and a little water added to dissolve the tablets this resulting brown fluid is then put into a larger vessel say an empty whisky bottle, and shaken, after one minute add one "C" tablet and shake till colour has disappeared. The water is then sterile. Larger quantities of the tablets can be used for larger quantities of water. The method is as effectual as it is rapid and should prove of immense advantage to the soldier on the march who can thus easily sterilize the water to be carried in his water bottle or to the sportsman in the jungle. To make good, palatable and safe "soda water" the sportsman has only to purify the water by these tablets and then add the "spearlet" to make aerated water. The only criticism we would make is that, although Messrs Smith, Stanistreet & Co in advertising these tablets refer to Lieutenant Nesfield's papers in the *Indian Medical Gazette* and recognise him as the discoverer of the method yet no hint of this is given in the pamphlet of instructions which accompanied the specimens we received, nor on the box containing the tubes.

We must say that the tablets are admirably made and elegantly dispensed quite equal in appearance to similar tablets made by London firms.

The Nesfield method of sterilizing water is well worth trying, and it can be taught to native servants without difficulty. To those in doubt about their water supply we say

get Nesfield's sterilizing tablets and use them. In surgical practice on field service or on the march these tablets seem also admirably adapted for the preparation of anti-septic lotions &c, for which sterile water is desirable.

We have recently (July, p 235) expressed our opinion on the value of the many preparations of Cyllin, brought out by the Jeyes Sanitary Compounds Company, London of 64 Cannon Street London. The recent literature on the use of Cyllin shows that it is rapidly taking a high place as a standard disinfectant more powerful than many in common use.

Recently Dr W. Hirtigan found Cyllin very useful in intractable spina basing his use of the drug on Bousfield's experiments which showed that the bacilli coli were practically destroyed in the living intestine without constitutional disturbance by the use of Cyllin (97 per cent. reduction). For internal use palatinoids of Cyllin are recommended. Count Ivan Tolmurski M.D. in the *Revue Internationale de la Tuberculose* (March 1905) has strongly advocated the use of Cyllin inhalations in tubercle of the lungs. It has been recommended instead of thymol for the removal of ankylosis tomes. It deserves a thorough trial in the form of palatinoids in cases of chronic dysentery.

OUR attention was recently called by a well known medical officer in Central India to the great value of Dahl's Milk and Cream. We have obtained specimens of it and have no hesitation in saying that it is the best preserved milk we have ever tasted. It is real milk and cream that is obtained from the fims not sticky sugary stuff, but pure good tasting milk. The cream is equally good, and we found too that the milk remained sweet after being opened for two days (in the climate of Darjeeling). For officers on tour or for *shikar* parties, this milk is strongly to be recommended. Indeed, after the recent revelations of the Health Officer in Calcutta on the awful state of the Calcutta dairies we are of opinion that it would be wise to use Dahl's milk in preference to that sold by the unspeakable Calcutta *grala*. It is not much dearer than Calcutta milk and the one is pure and sterile while the town milk is apt to be the reverse. The agents are F. R. Hill & Co, Churchgate Street Bombay and Mitchell Bardsley & Co, Olive Ghat Street Calcutta. This is a genuine pure milk to be thoroughly recommended. Messrs F. R. Hill & Co call our attention to their Proteine a very nourishing substance free from starch and sugar and therefore recommended for diabetic patients.

Notice

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters Articles Letters and Books for Review should be addressed to THE EDITOR *The Indian Medical Gazette* c/o Messrs Thacker Spink & Co Calcutta.

Communications for the Publishers relating to Subscriptions Advertisements and Reprints should be addressed to THE PUBLISHERS Messrs Thacker Spink & Co Calcutta.

Annual Subscriptions to the *Indian Medical Gazette* Rs 12 including postage, in India Rs 14 including postage abroad.

BOOKS, REPORTS, &c, RECEIVED

The Madras Sanitary Report
The U. P. Sanitary Report
The Punjab Sanitary Report
The Assam Vaccination Report
The Bengal Vaccination Report
The Madras Vaccination Report
The Bengal Chemical Examiner's Report
The Report of the Philippine Institute
Reports on Sleeping Sickness (No VI)
Report (III) on Malta Fever
Scientific Memoirs No 10 *Kala azar* &c

LETTERS COMMUNICATIONS, &c RECEIVED FROM —

Capt S P James I.M.S. Simla Major F Roberts, I.M.S. Simla
Major H Smith I.M.S. Jullundur Lt Col A. H. White I.M.S. Ferozpur
Major Charter White I.M.S. Naini Tal Lieut A. White I.M.S. Capt
Gordon Tucker I.M.S. Surat Major Fearnside I.M.S. Vellore Editor
Practical Medicine, Delhi Major J. Green, I.M.S. Mysore Singh "XX
Bhopal (no name given therefore not published) Major Calvert
I.M.S. London Major P. W. O'Gorman I.M.S. Lahore Major I
Rogers I.M.S. Calcutta Capt E. E. Waters I.M.S. Puri Capt Robb
I.M.S. Tinnevely Major Foulkes I.M.S. Chingoleput

Original Articles

THE FIRST CASE OF LEISHMAN-DONOVAN DISEASE OCCURRING IN A EUROPEAN IN BOMBAY*

By L. F. CHILDE,

MAJOR, I.M.S.,

Medical College, Bombay

THE patient, Mrs X, an English lady, in good circumstances, came to India for the first time 3½ years ago, she lived in Kathiawar and kept good health except for an occasional attack of fever, probably malarial, lasting for a few days. She was twenty-three years old and had two children.

In the beginning of April last, the exact date being unknown and whilst living at Bhownagar, she began to get fever, at first she thought little of it, and went about as usual, but as the fever persisted every day and was weakening her, she took to her bed on April 22nd, and from that date she came under regular treatment. In a report by Dr. Behramjee, her medical attendant, it is stated that she gradually lost flesh and strength, becoming weak, emaciated and anæmic, the temperature varied greatly, ranging between 97° and 105° F, and there was rigour or cold sensation at the onset of fever with profuse sweating at its decline. No disease was found in the heart or lungs, the urine was normal and never contained albumen, the tongue was fairly clean, appetite not lost, and there was constipation with flatulence. The spleen became much enlarged, and the liver extended to two inches below the costal arch. No rash was seen on the body, nor was œdema present at any time. She slept fairly well, she never became apathetic, nor did she lose her spirits. The treatment adopted was mainly quinine, from 12 to 20 grains being given daily, and on three occasions 5 grains were injected hypodermically, arsenic and diaphoretics were also tried. As, however, the patient was steadily growing worse, she was brought to Bombay in the middle of June, and came under my care. Her condition was then as follows: the disease having lasted about 65 days she was lying in bed, looking extremely ill, her face was sunken, the eyes deep, the nose sharp, the cheeks hollow, and the skin tightly drawn over the forehead, in fact the typical *Facies Hippocratica*, her complexion was pale and clear, like alabaster, except during fever, when a hectic flush was seen on either cheek, so, too, the skin of the body was pure white, and shewed no earthy tint, no eruptions were present, nor were there any ulcers, but there was a dusky discoloration over the sacrum due to a threatening bed-sore, and as for œdema,

none whatever could be found. The body was greatly emaciated, so that the ribs and bony prominences were clearly visible, the breasts were perfectly flat, as in the male type, and the muscles were flabby. The lymphatic glands were all normal. A string was twined around her wedding-ring to prevent it falling off, and this will convey some idea of the wasting that had taken place.

Anæmia was another marked feature, as shewn in the conjunctiva, lips, mucous membrane of the mouth and finger-nails, which were all of a pale pink colour, and with regard to the circulation, the pulse was soft, weak and compressible, ranging from 80 to 130 per minute in proportion to the temperature, whilst the heart-sounds were similarly weak, but no evidence of cardiac disease was detected. No hæmorrhages had occurred up to this time, neither from the nose, mouth, or lower parts of the alimentary canal, but, as will be mentioned later, there was blood in the stools towards the end. Nothing abnormal was made out in the lungs, there was no cough and the respirations were usually from 20 to 25 per minute, rising with the fever to 30 or more, the urine was of average quantity, yellow in colour, clear, with specific gravity 1012, it was acid, and contained neither sugar nor albumen, nor was anything seen under the microscope.

Concerning the alimentary system, the tongue was remarkably clean, and was moist, except when the temperature rose, the gums were in good condition, the throat normal, the appetite was fair, and she took nourishment well, the abdomen was a little distended due to flatulence, but there was no ascites, there was constipation, the bowels being moved only once daily after an enema, and the stools were semi-solid, sometimes shewing mucus, which was not mixed with the faecal matter but outside it.

The spleen was much enlarged and made an easily-seen prominence on the left side of the abdomen, it extended from the eighth rib above to the level of the anterior superior iliac spine below, and inwards to half an inch from the middle line, it was smooth, solid, easily movable and painless. The liver was also large, the upper limit of dulness being at the fifth rib in the right nipple line, whilst the lower edge could be easily felt two inches below the costal arch, and, like the spleen, it was smooth and free from pain.

The patient's mental condition was remarkably good, she was not at all dull or listless, nor did she even complain of headache, when her temperature was low, she was willing to talk, she would read books, and on one occasion I found her playing cards, and it was only during high fever that she liked to be quiet.

The peculiar features of the fever must also be described, on many days the temperature was low in the early morning, either normal or a little above or below, then came a rigour or else a

* A paper read at the Bombay Med. and Phys. Society

feeling of chilliness, followed by a rapid rise, so that by 10 A.M., the temperature was 104° , sometimes more. After several hours profuse perspiration set in, with a fall to about normal or lower, and in the evening the same sequence was repeated, the second rise occurring at about 10 P.M. But this was not the case every day, for sometimes the morning rise was abortive, sometimes the evening, on a few days there were three such rises, and again on some days, especially towards the end, the temperature was irregular, of no definite type. Also on reference to the chart it is seen that after the illness had lasted about 30 days, the temperature dropped, and rose no higher than 100° for 15 days, but after this interval, the fever returned and shewed the same features as before. Such was the condition of the patient when I saw her, the main symptoms being, in brief, persistent fever uninfluenced by treatment, marked enlargement of the liver and spleen, constipation, great emaciation with anæmia, and lastly a peculiarly good mental condition. The first question to decide was that of diagnosis. The patient being a young European, enteric fever was considered but only to be dismissed, as the symptoms were incompatible with this idea. Chronic malaria was next thought of, and to settle this point all quinine was stopped for three days, three separate examinations of the blood were then made, but no malarial parasites whatever could be seen. Next fifteen grains of quinine were injected hypodermically on four successive days without producing the slightest effect on the temperature. These measures disposed of the possibility of malaria. Malta fever next suggested itself, for, although there had been no pain or swelling of joints, yet in other respects the symptoms were not unlike those of this fever. Accordingly two blood tests were made for the Malta fever re-action with separate strains of the micrococcus melitensis, but both of these tests were absolutely negative. Chronic concealed suppuration was next considered, such as a deep seated liver abscess or hidden empyema, &c, but not the slightest evidence could be found of these conditions, so, too, one thought of tuberculosis, or chronic ulcerated endocarditis as possible causes, but all these hypotheses had to be discarded for lack of proof. The idea of Leishman-Donovan disease next presented itself, as in addition to the cachexia with large liver and spleen, there was the marked peculiarity of the temperature, namely, a double daily rise. My attention was directed to this by the writings of Major Leonard Rogers, I.M.S., who states "Sooner or later, in progressive cases, the temperature rises to a higher level and a very irregular remittent type appears, the most marked feature of which is a tendency for a double or even a triple rise to take place within twenty-four hours, one rise occurring in the early morning and a second in the afternoon or evening." A splenic puncture was therefore made and a few

drops of pale watery blood easily withdrawn. Six slides were prepared and stained by Leishman's method, all of them showed undoubted Leishman-Donovan bodies. They were few in number, fifteen parasites being counted in twenty fields (one parasite to 13 field). Thus the question of diagnosis was solved.

The remaining history of the case can be told in a few words. The patient went on in the same condition until the 22nd of June, but on this date instead of constipation, the stools became loose. They were thin, watery, offensive and contained blood and mucus. From six to twelve were passed daily, and they could not be checked by any treatment. Coincidentally with this change in the stools the patient's general condition became rapidly worse. She now for the first time became dull and listless, she took nourishment unwillingly, and her heart became much weaker, also œdema of the feet, hitherto absent, was now observed.

The variations of temperature were now found to be less, as also the rigors and sweating. She became weaker daily, a bed-sore developed over the sacrum, the evacuations were passed involuntarily, the pulse-rate rose to 140 and 150 per minute, she was quite collapsed, passed into a state of coma, and finally she died on July the 7th, after an illness of about 90 days. As may be inferred from the above account, the diagnosis of this case was reached with some difficulty, partly no doubt owing to one's unfamiliarity with the disease and its rarity in Bombay, as up to the present only three cases have been reported in natives, whilst, as far as can be ascertained, no European case has hitherto been recorded in this town, or in Western India. It remains to draw attention to a few points of interest. The main features of the disease, as given by Major Donovan, are as follows —

Persistent fever unaffected by treatment. Progressive emaciation and anæmia. Enlargement of the liver and spleen. Loose motions either like diarrhoea or dysentery.

Eruptions or ulcers on the skin. Hæmorrhages beneath the skin or from the various mucous membranes. Pigmentation of the skin, marked on the hands and feet, or a general pigmentation of the whole body. Œdema of the feet.

Albumen in the urine.

Various complications, such as cancerous, ulceration in the mouth, bronchitis or bronchopneumonia.

In this case, however, the first three symptoms were the prominent ones, on the other hand, constipation was present throughout, except just at the end, and all the remaining symptoms were absent, except œdema of the feet, which only came on in the last week.

With regard to treatment, nothing was of any avail in this case, it is said that frequently the fever is stopped or greatly decreased by quinine, but in this instance quinine had no effect whatever.

The interesting question remains as to how this patient became infected. From enquiries made of medical men at Bhowanagar, which was her home, it appears that the disease is not known there, nor in other parts of Kathiawar which she occasionally visited. During 1904 she lived at Nami Tal and Almorah until November, when she went to Jubbulpore for a week and then back to Bhowanagar. It is possible that she contracted the disease at Jubbulpore, as cases are known to have occurred in that neighbourhood, but I could not find that she had come in contact with any case there; also the visit to Jubbulpore took place four months before the disease commenced.

FURTHER EXPERIMENTS ON THE BACTERIOCIDAL POWERS OF CHLORINE AND IODINE, WITH A NOTE ON THEIR APPLICATION TO THE PURIFICATION OF WATER ON FIELD SERVICE

BY V. B. NESFIELD, F.R.C.S.,

Lieut. I.M.S.,

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In the August number of the *Indian Medical Gazette*, Captain Windsor experimenting with iodine, found that it was lethal to cholera, typhoid and coli organisms in one minute, when present in the strength of 1 part in 260,000, and lethal to anthrax and Hay bacilli spores in the same time, but in the dilution of 1 part in 8,000.

These experiments coincided with mine, as also did his chlorine value for typhoid, namely, 1 in 350,000.

Captain Windsor concludes his article by remarking that many observers have determined the bacteriocidal powers of iodine and chlorine, but have always found lower germicidal values than the above, and concludes that broth cultures were used in the experiments. This is the important point, for as a matter of fact 1 in 17,000 is, I believe, generally considered to be the germicidal value of iodine and chlorine. My contention is, that if typhoid bacteria are immersed for one minute in a 1 in 260,000 solution of iodine, they die.

Now if 1 cc of a broth culture be poured into 10 cc of a known solution of a disinfectant (in this case iodine) "according to a method greatly in vogue," and then samples be taken from this to test the germicidal effect, a totally wrong conclusion will be arrived at in the case of disinfectants that combine with and are neutralised by the organic matter of the broth, and the higher the state of dilution, the greater will be the error.

For instance if 5 cc of distilled water were poured on to a 24-hour agar slope of typhoid, and the growth removed from the surface with

a platinum loop, by shaking an emulsion was formed, this emulsion was poured into a known solution of iodine, and was found by titration to have absorbed 0.037 gramme of iodine.

Now 0.037 gramme of iodine in 500 cc of water equals 1 part in 100,000. So that by adding 1 cc of this typhoid emulsion to 10 cc of the above iodine solution, all the iodine will be at once removed, and no germicidal action will result, and a wrong impression will be obtained.

With a 24-hour old broth culture in place of this emulsion the results would be more disastrous still.

But by removing a loopful of culture from a 24-hour old agar slope, and emulsifying this in 5 cc of water, diluting up to 25 cc and pouring 5 cc of this emulsion ($\frac{1}{2}$ loop) into 1 litre of a known iodine solution, a practically accurate result will be obtained, but even then for absolute accuracy, the solution should be titrated after the bacteriocidal tests have been completed.

Now to sterilise a water with iodine, it is necessary to add the lethal quantity, plus the quantity absorbed by the water.

From a practical point of view this quantity absorbed can be divided into two values, "one" the quantity absorbed by average waters, "two" the quantity absorbed by extraordinary waters.

Dealing firstly with the quantity absorbed by average waters, this includes anything from rain water to river and well waters free from great organic pollution, the rough line of demarcation between this group and the next being whether Pot. Iod. and starch with dilute sulphuric acid give a blue colour or not (showing the presence of nitrites), for it is waters containing organic matter in the state of decomposition and oxidation that absorb most iodine and chlorine.

Iodine absorption for various waters.

Water	Grammes per litre	Grains per gallon.
The Jumna at Agra	0.0039	0.1755
Tap water at Agra	0.0031	0.1404
An average well water, India	0.0031	0.1404
A very old disused well	0.0079	0.351
Thames at Vict. Emb., London	0.0313	2.1831
London tap water	0.022	1.534

Chlorine absorption for various waters

Water	Grammes per litre	Grains per gallon
The Jumna at Agra	0.0009	0.06
Tap water at Agra	0.00084	0.059
An average well water, India	0.00084	0.059
A very old disused well	0.0022	0.16
Thames at Vict. Emb., London	0.015	1.096
London tap water	0.00572	0.39

It will be noticed that the values of absorption of iodine and chlorine are very similar, when due regard is given to their atomic weights

For instance, London tap water absorbs 0.39 grains of chlorine per gallon, multiply this by 127 (atomic weight of I) and divide by 3.55 (atomic weight of Cl) - 14 grains (nearly) of iodine per gallon absorbed by London tap water. These results were obtained independently

It has been noted that if free iodine be present in water to the extent of 1 in 260,000, then that water will be free of the coli family of organisms, including cholera

In other words, 0.0384 gramme per litre or 26784 grain per gallon

Now in my experiments on average waters, I found that London tap water at the Victoria Embankment absorbed the largest quantity of iodine, and that although it is wonderfully pure as regards organisms, etc., yet in this respect it is worse than Jumna water below Agra, the Ganges at Allahabad, and the Nerbudda at Jubbulpore, and any well water hitherto examined, no doubt because it is derived from the Thames which has a number of large towns on its banks from Oxford to Hampton Court from where the water-works derive their supply, the fact that the Thames is locked must also be remembered

Let me then class this water when half its iodine-absorbing power is added again to its original value as the maximum average water

0.39 grain per gallon plus 0.195 grain making 0.585 grain per gallon. Add to this value 26784 grain per gallon as the lethal quantity necessary to be free, and we arrive at the figure 3263 grain of iodine to be added to each gallon, and allowed to act for one minute, to render any but the worst water safe to drink. To do this conveniently tablets* have been prepared consisting of a compound of five parts of potassium iodide, and one part of potassium iodate forming one tablet, and the necessary quantity of citric acid to set all the iodine free as another tablet. On breaking these two up and adding water (1 ounce), an iodine solution is produced containing a known quantity of iodine, and which can be added to a known quantity of water to render it sterile

One grain of the mixture = 5K1 K10, gives on acidification 72 grs of iodine sufficient to sterilise 2 gallons of the above extreme case of an average water, leaving moreover 0.674 grain of iodine in excess of the required quantity. To make matters absolutely safe, the quantity of iodide iodate mixture actually advised is 1½ grains for each 2 gallons, giving 5 grains of iodine per gallon

As can be seen from the above figures, and what does actually hold good, the iodine in this 1½-grain tablet is sufficient to sterilise 3.8 gallons

of an average well water, so that I feel perfectly confident in advising this quantity of iodide iodate for 2 gallons of water. Now what about waters that are heavily polluted, and how is it possible to tell the quantity of iodine necessary to sterilise them? This quantity depends upon the quantity absorbed

So that by gauging the quantity absorbed, the value of iodine necessary to add to the water to effect its sterilization can be arrived at. The above 1½-grain tablet is equivalent to 1.08 grain of iodine, call it 1 grain, dissolve one and its accompanying acid tablet in an ounce of water, and then make up to one pint

Take half a gallon of the water to be experimented with, and place it in a white enamelled hand basin, and add the iodine solution to it gradually, stirring at the same time, and note when any permanent yellow tinge remains. Read off the quantity of iodine added. This will give the quantity half a gallon absorbs. If one ounce is used, 0.5 grain will have been absorbed = 1 grain per gallon leaving 8 grains to sterilise 2 gallons which is amply sufficient. Practically then if half a gallon of any water absorbs less than 2 ounces of the above pint iodine solution, then the quantities of iodide iodate mixture given above hold good, viz, 1½ grains per 2 gallons (1 tablet). If 2 to 4 ounces are absorbed, then twice the quantity must be used for two gallons (2 tablets). Thames water at the Victoria Embankment only absorbs 4.3 ounces of this solution, and it is hardly possible to obtain a fouler water than this

Two grains of iodine per gallon is sufficient in 15 minutes to kill all coli organisms in Thames water filtered through filter paper so as to remove floating particles

It should be noted that pond water is not so foul as is generally thought, as the vegetation on the surface removes a large quantity of combined nitrogen

As regards chlorine very nearly the same facts apply as above, the quantity now advocated for sterilization is 1.5 grammes for every 50 gallons (465 grain per gallon) exposure, 5 minutes, to bring it in a line with iodine for the severe average waters mentioned above

The quantity necessary to add to abnormal waters being gauged by the above iodine method. It should be noted again that an abnormal water, as far as these two processes are concerned, is an abnormally halogen absorbent water, as this to a large extent depends upon nitrites, blue colouration with K. I starch and dilute H₂SO₄ will at once tell it. The Thames water below Westminster Bridge is supposed to be free of nitrites, but this is not the case, or at least it was not so in June last, the water becoming inky in appearance on applying the above test. It gave also the other nitrite tests

Having gone into these points of germicidal values, etc., and having arrived at the fact that 5 grain of iodine per gallon and 465 grain of

* Smith, Stanistreet & Co., Calcutta

chlorine per gallon can be relied upon to rid water of living coli, typhoid, and the dysentery organisms available, the question arises how can these two chemicals be applied practically for the field and for the cantonment. The methods have been previously described in the *Indian Medical Gazette*, but may bear repetition.

THE IODINE METHOD

Tablets are prepared of three different sizes consisting of three separate tablets in each size, an iodide, an acid, and a sulphite.

The sizes correspond to 26 ounces (quart bottle), 2 gallons and 8 gallons.

The composition of the iodide tablet is as follows, "labelled A"—

$1\frac{1}{2}$ grains of iodide salt according to the formula $5 KI + KIO_3$

The acid tablet "labelled B" is—

Citric acid $1\frac{1}{2}$ grains

The sulphite tablet "labelled C" is

{ Soda sulphur exc, $\frac{1}{2}$ grain
{ Soda bicarb, $\frac{1}{2}$ grain

These are for 2 gallons of water, the tablets for 8 gallons are 4 times as large.

The tablets for 26 ounces are—

A. Iodide Salt, $\frac{1}{2}$ gr
B. Citric Acid, $\frac{1}{2}$ gr
C. { Soda Sulphur, $\frac{1}{2}$ gr
{ Soda Bicarb, $\frac{1}{2}$ gr

A and B tablets are broken up together in a dry cup, and an ounce of water added to the crushed tablets an iodine solution results, this is poured into the requisite quantity of water, and allowed to act for one minute, when the iodine is discharged by adding the "C" tablet, leaving the water tasteless.

In cantonments, having discovered the absorbing power of the water, it is in most places possible to use twice the quantity of water mentioned. For sterilising water for soda water manufacture this is a very convenient and cheap method, and I have used it for preparing the mess soda for the last 11 months.

Then an extremely small quantity of iodide left in the water has no deleterious effect whatsoever.

THE CHLORODINE METHOD

The chlorine is prepared as the liquid gas, stored in steel cylinders, capable of withstanding very great strain. Twenty pounds of the liquid gas require 20 lbs of metal in the shape of the cylinder and its attachments.

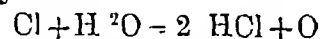
The cylinder is provided with a tap, and in front of the tap a resistance which only permits when the tap is full on, $1\frac{1}{2}$ grammes of chlorine to escape in two minutes this suffices for 50 gallons.

The gas is conducted by high pressure rubber tubing specially selected to an aluminum diffuser, which gives out the chlorine in very minute bubbles, which rising in the water dissolve before they reach the surface. For each 50 gallons, gas is allowed to pass for two minutes.

There is nothing in the apparatus that can get out of order even with the roughest use. When the flow of gas is stopped, it is allowed to act on the water for five minutes, then it is discharged, and the water rendered tasteless by throwing in sulphite of soda arranged in small packets $H_2O + Cl + Na_2 SO_3 = Na_2 SO_4 + 2 HCl$.

The final result contains about half a grain of sodium chloride per gallon of untreated water.

Here again in cantonments twice the quantity of water can be sterilised by two minutes of gas if the water is known, also if left for 24 hours the Chlorine will disappear of itself rendering the addition of sulphite of soda unnecessary.



The cost of this process is 500 gallons for one penny, this together with its rapidity, simplicity, and portability (40 lbs in all for 900,000 gallons), suggest that possibly it may be useful in filling the gap where it is impossible to apply the ordinary measures used for the sterilisation of water, and even to replace old systems at present in use in cantonments, e.g., boiling, or candle filters.

My very best thanks are due to Captain Windsor, I.M.S., at Agra, for his valuable assistance, and also to Major Fowler, R.A.M.C., at the Vict Embankment Laboratory, London.

NOTE—Six cylinders will shortly arrive from England quite complete, which are at the service of any officer wishing to put the process to the test. There is also one in use in Jubbul-pore.

"In the July number *I M Gazette*, 3 lbs of liq Cl are stated to sterilise 680,000 gallons, read instead 133,000 gallons."

THE TREATMENT OF CHOLERA WITH IZAL

By E. E. WATERS, M.D.,
CAPTAIN, I.M.S.,
Civil Surgeon, Puri

DURING a recent epidemic of cholera in Puri district, in which the mortality had been exceedingly high, and the usual methods of treatment consequently ineffectual, it occurred to me to employ medicinal Izal in large doses.

The results were very satisfactory and the percentage of recoveries much higher than with any other remedy we had in use.

I have no wish to claim for Izal the virtues of a specific, certainly not on the experiences of a part of only one epidemic.

Many specifics for cholera have appeared from time to time, giving excellent results when first tried, only to prove useless when used in a subsequent epidemic.

These cases are therefore published as a preliminary series, and further trial will be made as occasion arises.

Two very proper criticisms may be offered on my cases.

(a) That they occurred at the close of an epidemic, when the virulence of the disease was abating (or, as I was unkindly told, when patients *will* get better in spite of treatment)

(b) That the cases were selected ones

With regard to the former of these, it is true that the epidemic was abating, but none the less the mortality amongst the untreated was still high—the daily death-rate being eight or nine from cholera alone

Secondly, there was bound to be some selection of cases, for it would be hopeless to expect any benefit from a drug like Izal when collapse had set in

We only got to hear of many cases when they were at the point of death and quite beyond medical aid of any kind

Short of this, we treated every case with Izal, that is to say, any cholera patient who was still purging and vomiting was given Izal, whilst to those who had passed that stage and were collapsed, stimulants or saline injections were given

Mode of administration—For convenience of carriage the drug was put up in concentrated stock solutions, of which each fluid drachm contained fifteen minims of Izal made up with mucilage of tragacanth

At the time of use, each drachm of stock solution was diluted with seven drachms of water and administered to the patient

I directed it to be given often, usually one ounce immediately, one ounce after an hour, and then one ounce every two hours as long as necessary

The frequency of the dose after the first three or four doses naturally was regulated by the condition of the patient

Effects of the drug

In most cases the good effect of the treatment was evident after the second dose. The vomiting and the purging diminished or ceased and the character of the stools changed very quickly (It must be remembered that we were working in the poorest of native houses where clinical observation and case taking were matters of the greatest difficulty)

It was frequently noticed that the stools smelt of Izal, and that in a few cases they became of a bright green colour. Intestinal parasites (which are very common in Orissa) were often voided after the Izal had been given, so that the drug is also of value as an anthelmintic. The only discomfort caused was a burning pain in the epigastrium and this was by no means universal

I append short notes of the cases treated. I would again repeat that collapsed and obviously dying people were excluded, otherwise every case brought to notice was treated with Izal and with nothing else

The hospital assistants in close contact with the sick expressed the firmest belief in Izal and even went so far as to themselves take occasional doses as a prophylactic

Illustrative Cases

SERIES A

(1) 10th August 1905 *Danardan Das*—age 30. Ill six hours when first seen. Frequent vomiting and purging. General condition good. Izal given 2 p.m. Better. Purging and vomiting stopped. Pulse good. Izal continued.

11th August 1905 *Morning*—Better. Threestoools. No collapse. Pulse good. Feels very weak. Passed urine 2 p.m. urine passed. No purging. Recovery uneventful.

(2) 10th August 1905 *Radhu*—Female, age 16 years. Been ill for eight hours. Vomiting and purging continuous. General condition poor, but not actually collapsed. Izal, 2 p.m. No better, cannot retain medicine or food. Weakness increasing. Bismuth followed by Izal.

11th August, 1905—Patient collapsed and died.

(3) *Radhi*—Female, age 40. Been ill four hours. Four stools, vomiting. General condition good. No collapse. Izal given.

Evening—Improving. Purged twice but stools of better character. Vomiting stopped.

11th August 1905—Still improving. Izal continued.

Evening—Patient hungry, feeling better.

12th August 1905—Recovery slow, but uneventful.

(4) *Vidhu Sahu*—Male, 14 years. Ill three hours. Frequent vomiting and purging. Patient restless, but not collapsed. Izal.

Evening—Vomiting and purging continue, urine not passed. General condition slightly improved. Izal continued. Mustard plaster to loins.

11th August 1905—One stool only. Passed urine. General improvement. Izal continued.

12th August 1905—Two stools with urine. Restlessness marked. Izal stopped.

13th August 1905—Recovery uneventful.

(5) 10th August 1905—*Manila*—Female, 40 years. Ill six hours. Vomited thrice, purged six times. Very weak and distressed. Izal.

Evening—Vomited once, purged thrice. Stools changing, getting a little colour and smelling of Izal. Izal continued.

11th August 1905—Purging and vomiting stopped. Pulse improving. Izal continued.

Evening—No purging or vomiting. Doing well, very restless. Izal stopped.

13th August 1905—Urine passed for first time. Recovery uneventful.

(6) 10th August 1905—*Radha*—Female, 6 years. Ill four hours with vomiting and purging. General condition had. Izal given. Vomiting and purging continued.

Evening—Child weaker, voice sinking. Izal continued.

11th August 1905—Purging and vomiting gradually stopping. Pulse improving. Izal continued.

Evening—Purging and vomiting stopped. Child is very weak.

12th August 1905—Urine not yet passed. Purging and vomiting stopped. Marked weakness. Continues Izal with alternate doses of diuretic.

Evening—One stool passed with urine. General condition a little better.

13th August 1905—Recovery uneventful.

(7) 10th August 1905 — *Narayan Panda* — Male, 14 years Ill six hours Vomiting and purging General condition good Izal given
Evening — Vomiting increasing Purging stopped Boy is weaker Izal

11th August 1905 — Vomiting is very troublesome Rejects everything Bismuth
Evening — Vomiting ceased Stimulant

12th August 1905 — Improving Very restless Urine suppressed Diuretics

13th August — Urine passed Recovery uneventful

(8) 11th August 1905 — *Radhu Sahu* — Female, 10 years Seen one hour after passing two rice water stools Izal
 Some vomiting later
 12th August 1905 — Much improved
 13th August 1905 — Recovery uneventful

(9) 12th August 1905 — *Jama* — Male, age 17 Had passed five rice water stools and vomited General condition good Izal
 13th August 1905 — One stool passed, some urine
Evening — Urine not passed Diuretic
 14th August 1905 — Urine passed Uneventful recovery

(10) 12th August 1905 — *Chimpa* — Female, 60 years Seen six hours after attacked by cholera Purged nine times, vomiting four times Pulse good Patient very weak and old Izal
Evening — Purging and vomiting continued Some urine passed Patient weaker
 13th August 1905 — Purging and vomiting stopped Patient very weak
Evening — No purging or vomiting Urine passed freely Getting weaker Izal
 14th August 1905 — One stool Urine suppressed Weaker Diuretics and stimulants
 15th August 1905 — Collapse
 16th August 1905 — Died

(11) 12th August 1905 — *Minika* — Male, 27 years Ill eight hours Rice-water stools, &c Izal
Evening — Has passed five stools General condition good, Izal
 13th August 1905 — Two stools Very weak
Evening — Passing urine One stool containing round worms Izal stopped Restlessness
 14th August 1905 — Recovery uneventful

(12) 12th August 1905 — *Gourinda Das* — Male, 21 years Ill 24 hours Purging going on, cramps, &c Izal given
Evening — Pulse weak Purging continues, but in less quantity
 13th August 1905 — Two stools, no vomiting, urine free
Evening — Three stools Improving Recovery uneventful

(13) 13th August 1905, evening — *Radu Sahu* — Male, 14 years Ill with cholera five hours Izal given
 14th August 1905 — Purging ceased Vomiting going on General condition good Mixture continued Vomiting stopped with Bismuth
 15th August 1905 — Recovery uneventful

(14) 14th August 1905 — *Mokila* — Female, 60 years Had been ill with cholera for nine hours Passing rice water stools, &c Izal given
Evening — General condition good Passed three stools No vomiting Izal continued
 15th August 1905 — No purging or vomiting Pulse good General condition good
 16th August 1905 — One stool Urine free Recovery uneventful

(15) 15th August 1905 — *Moni* — Female, 18 years Ill for 10 hours with purging and vomiting Izal given
 Took the medicine, but put herself under the care of a local *babaji* who was performing many marvellous "cures"

16th August 1905 — Has given up the *babaji* and returned to the legitimate line for more Izal
Evening — Better, but has got fever (There is a good deal of heating with bamboos in the *babaji's* pharmacopœia, so this is not surprising)

17th August 1905 — No further purging Recovery uneventful

(16) 15th August 1905 — *Muguni* — Female, 45 years Ill with cholera for six hours Vomiting and purging General condition good Izal given
Evening — Two stools Vomiting stopped Pulse good Izal continued
 16th August 1905 — Two stools Improving Izal continued
 17th August 1905 — Urine suppressed Diuretics given
Evening — Urine passed
 18th August 1905 — Recovery uneventful

(17) 16th August 1905 — *Sammit* — Female, 21 years Attacked with cholera Rice water stools, &c Pulse and general condition good Izal given
Evening — Vomiting and purging stopped Improving
 17th August 1905 — Only one stool Izal
Evening — Has passed no urine Diuretics given
 18th August 1905 — Recovery uneventful

(18) 17th August 1905 — *Dandu Mahanty* — Male, 30 years Had passed five stools and vomited three times General condition bad Izal ordered
 2 p.m. — Medicine not taken His friends had called in the *babaji* above mentioned and a *kamraj* Died in collapse

(19) 18th August 1905 — *Mohari Nail* — Female, 22 years Ill with cholera two hours Five rice-water stools Izal
Evening — Doing well Passed four stools Pulse fair Izal
 19th August 1905 — Improving One stool Vomited twice
Evening — Urine passed, doing well
 20th August 1905 — Recovery uneventful

(20) 18th August 1905 — *Sulbarsan Misra* — Male, 60 years Ill for twelve hours Before treatment passed 20 stools, much vomiting A weak old man Izal
 4 p.m. — Collapsed and died

(21) 21st August 1905 — *Radha Mohun Das* — Male, 23 years Ill with cholera for twenty-four hours Vomiting and purging going on No collapse General condition fair Izal
 22nd August 1905 — Vomiting stopped, three stools No collapse Izal
Evening — Improving No stools, urine passed Is very weak Stimulant given
 23rd August 1905 — Recovery slow, but uneventful

(22) 22nd August 1905 — *Balukrishna Pujari* — Male, 40 years Ill with cholera for four hours Six rice water stools Vomited No collapse Izal
Evening, 3 p.m. — No collapse General condition fair Pulse good Two stools Vomited once Izal
 6 p.m. — A local quack (who practices on the strength of having acted as ward cooly for a month or so) was at this stage called in A few hours later the patient again asked for regular treatment
 23rd August 1905 — No collapse Passed two stools Urine not passed Izal
Evening — Urine still suppressed Diuretics and mustard locally
 24th August 1905 — Patient died from uræmia

(23) 22nd August 1905 — *Biswanath* — Male, 22 years Ill with cholera for five hours Purging and vomiting Izal

Evening — Passed urine Improving

23rd August 1905 — Better Vomiting and purging stopped

24th August 1905 — Recovery uneventful

(24) 25th August 1905 — *Ruma Maheswar* — Male, 6 years Ill with cholera two hours Purged four times, vomited twice Izal given

Evening — Doing well Stools less frequent

26th August 1905 — Improvement continued, has fever

27th August 1905 Recovery uneventful

SERIES B

(25) 9th August 1905 — *Radhsham Das* — Male, 45 years Seen at 7 30 AM suffering from obvious cholera for three hours with copious rice water vomiting and purging General condition good No collapse Izal given

2 PM — Better Vomiting and purging stopped Izal continued

10th August 1905 — Still improving Izal occasionally.

11th August 1905 — Recovery uneventful Izal alone given

(26) 9th August 1905 — *Madhu Maheswar* — Male, 30 years Seen at 10 AM Ill for three days Vomiting and purging General condition bad Pulse imperceptible Collapse coming on Izal and stimulants given Hot fomentations and ginger friction

2 PM — Patient worse Died at 6 PM

(27) 9th August 1905 — *Kunjia* — 10 years Seen at 11 AM suffering from cholera for four hours Rice water vomit and stools General condition good No collapse Izal given

2 PM — Better Vomiting stopped, some diarrhoea persists Izal continued

10th August 1905 — Improvement continued Passed urine Izal continued

11th August 1905 — Recovery uneventful Izal alone given throughout

(28) 9th August 1905 — *Bisa* — Male, 30 years Seen at 4 PM suffering for two hours Vomiting and purging General condition fair Pulse fair Urine suppressed Izal given

10th August 1905 — Improving Vomiting ceased Some diarrhoea No urine Izal continued Hot fomentations to loins

11th August 1905 — Recovery uneventful Urine passed Izal only given

(29) 9th August 1905 — *Fakira* — 10 years Seen at 2 PM Attacked in morning with cholera Copious vomiting and purging General condition good Pulse fair Izal

10th August 1905 — Improving Vomiting ceased Purging continues, thirsty Urine expressed Izal

11th August 1905 — Improving Passed urine

12th August 1905 — Recovery uneventful Only Izal given

(30) 10th August 1905 — *Fakir Ruth* — Male, 40 years Seen at 1 PM suffering from marked cholera for six hours Much vomiting and purging General condition bad Pulse very weak Collapse commencing Urine suppressed Izal and stimulants given Hot fomentations, ginger friction, &c

11th August 1905 — Patient collapsed No pulse Stimulants only No Izal

2 PM — Patient died

Note — This was hardly a proper case for Izal.

(31) 11th August 1905 — *Narsing Das* — Male, 40 years Seen at 6 AM Attacked during the night Vomiting and purging General condition good Pulse fair Urine suppressed No collapse Izal given

2 PM — Better Vomiting stopped Purging diminished No urine passed Izal

12th August 1905 — Improving Purging stopped Urine passed Izal

13th August 1905 — Recovery uneventful Only Izal given

(32) 11th August 1905 — *Gopinath* — Male, 8 years Seen at 10 AM Attacked in early morning Copious vomiting and purging General condition fair Pulse good No collapse Izal

3 PM — Patient collapsed suddenly and died

(33) 11th August 1905 — *Shama* — 8 years Seen at 5 PM Ill for four hours Vomiting and purging General condition good Pulse fair Izal

12th August 1905 — Improving Stools changed in character One round worm passed Urine free Izal

13th August 1905 — Recovery uneventful

(34) 12th August 1905 — *Pata* — Female, 32 years Seen at 7 30 AM Cholera with purging and vomiting for four days General condition bad No pulse Collapsed Izal given once, but patient was dead by 9 AM

(35) 12th August 1905 — *Parbati* — 10 years Cholera for four hours Purging, but no vomiting. Pulse fair General condition good Izal

13th August 1905 — Improved Round worms passed

14th August 1905 — Recovery uneventful

(36) 12th August 1905 — *Miti* — Female, 60 years Seen at 5 PM Ill for three hours General condition good No collapse Izal given

13th August 1905 — Some improvement Purging continues Vomiting ceased Izal

2 PM — Colour of stool changed Quantity less Izal

14th August 1905 — Patient died Collapsed at 4 AM

(37) 13th August 1905 — *Biswanath* — Male, 35 years Seen at 10 PM Ill with cholera for 24 hours General condition not good Pulse hardly perceptible Collapse commencing Izal and stimulants given

14th August 1905 — Patient died at 4 AM

(38) 14th August 1905 — *Bera* — Female, 50 years Has been suffering from cholera since early morning General condition bad Collapsed Izal and stimulants given, but the patient died next day

(39) 14th August 1905 — *Israr Godhi* — Male, 56 years Suffering for some hours Purging and vomiting General condition doubtful, rather collapsed Izal

15th August 1905 — Slight improvement Very restless Four stools Tendency to vomit Izal

16th August 1905 — Not doing well Tympanites

17th August 1905 to 19th August 1905 — Steady improvement Passing urine freely Hungry Tonic mixture

20th August 1905 — Not feeling well Pain in loins Passed smoky urine Rigor

21st August 1905 — Not so well Face oedematous

22nd August 1905 — Died comatose Uræmia

(40) 15th August 1905 — *Gopi Potti* — Male, 26 years Suffering with cholera for a few hours Somewhat collapsed Thready pulse Restless Clammy perspiration, &c Izal

16th August 1905 — Purging and vomiting stopped Very restless Urine smelly of Izal Izal

17th August 1905 — Passed seven watery scanty reddish stools with an Izal odour Nausea Izal

18th August 1905 — Better Three bilious stools Abundant urine Recovery uneventful

(41) 16th August 1905 — *Piari* — Female, 45 years Ill for eight hours Seen at 2 p.m. Collapse setting in Izal

17th August 1905 — Very restless and thirsty Vomiting and purging stopped Passed reddish urine with Izal odour

18th August 1905 — Much nausea Three round worms

19th August 1905 — Improving Three stools, dark colour Two round worms Urine still scanty Recovery uneventful

(42) 16th August 1905 — *Dinabundhu* — Male, 6 years Seen at 8 a.m. Cholera for two hours Symptoms marked General condition good No collapse Izal given

4 p.m. — Better Vomiting stopped Stools less frequent

17th August 1905 — Much better Recovery uneventful

(43) 17th August 1905 — *Rama* — 16 years, milkmaid Seen four hours from onset of first symptoms Well marked case Cramps, vomiting, &c Pulse feeble Urine suppressed Izal

18th August 1905 — Improving Urine not passed Stools smell of Izal

19th August 1905 — Much improved Stools changed in colour Recovery uneventful

SERIES C

These cases occurred in a village a few miles from Puri. The patients were treated by a hospital Assistant who had been working in the Puri outbreak

(44) 20th August 1905 — *Ananta Misra* — Male, 20 years At first attacked with diarrhoea and treated with astringents After a few hours cholera supervened Rice water stools Vomiting, cramps, &c Izal given in place of astringent

21st August 1905, 6 a.m. — Vomiting and purging not stopped Collapse commencing Izal and stimulants given

2 p.m. — Vomiting ceased Purging continuous

7 p.m. — Improving No further collapse

22nd August 1905 — Still some purging Otherwise better

23rd August 1905 — Recovery uneventful

(45) 20th August 1905 — *Sari* — 7 years Seen at 5 p.m., Cholera for three hours Vomiting and purging cramps, &c General condition fair, but patient appeared to be a weakly child Izal

21st August 1905 — Better Vomiting stopped Some abdominal uneasiness Izal continued

22nd August 1905 — Recovery uneventful Passed three round worms

(46) 21st August 1905 — *Lokenath Misra* — Male, 50 years Seen at 6 a.m. Attacked with cholera at midnight Pulse fair No collapse Vomiting and purging Severe case Izal

2 p.m. — Better Vomiting stopped Purging continued

22nd August 1905 — Symptoms of collapse Purging continues Izal and stimulants

2 p.m. — Not so well Collapse increasing No pulse Stimulants

6 p.m. — A little better Pulse again perceptible

23rd August 1905 — Improving Purging and vomiting stopped No collapse Passed urine Stimulants omitted

2 p.m. — Not so well Pulse failing Symptoms of collapse Stimulants, ether, &c

Hæmorrhage from mouth and nose Died 6 p.m.

(47) 21st August 1905 — *Chundri* — Female, 25 years Seen at 7 a.m. Cholera for two hours General condition good Izal

2 p.m. — Vomiting stopped Some purging still Izal continued

22nd August 1905, 7 a.m. — Improving Character of stool changed Urine passed in evening

23rd August 1905 — Recovery uneventful

(48) 21st August 1905 — *Annapurna* — Female, 39 years Seen at 11 a.m. after five hours' cholera, General condition good Vomiting marked Izal

2 p.m. — A little better

22nd August 1905 — Better No vomiting or purging Passed urine

23rd August 1905 — Recovery uneventful

(49) 22nd August 1905 — *Bhikari Mahapatra* — 10 years Attacked during the night Seen at 7 a.m. Usual symptoms Izal

2 p.m. — Rather better Vomiting stopped Purging continues Izal

23rd August 1905 — Improving Passed urine Purging ceased Recovery uneventful

(50) 23rd August 1905 — *Krishna Misra* — 10 years, Seen at 8 a.m. Had been suffering for three hours General condition good Izal

3 p.m. — Rather better Vomiting stopped Purging diminished Izal continued

24th August 1905 — Purging stopped

25th August 1905 — Recovery uneventful

(51) 24th August 1905 — *Bhubani Misra* — Male, 26 years Attacked during the night Seen at 10 a.m. Severe case Usual symptoms Izal

2 p.m. — Improving Vomiting stopped Purging continued Izal

25th August 1905 — Better No purging

26th August 1905 — Recovery uneventful

(52) 28th August 1905 — *Kalia* — Male, 6 years Seen at 4 p.m. Ill of cholera for three days Patient very weak Not collapsed Izal

29th August 1905 — Vomiting stopped Purging continues Izal

4 p.m. — A little better

30th August 1905 — Passed urine Recovery uneventful

(53) 28th August 1905 — *Gouri* — Male, 9 years When seen at 4 p.m., had been suffering from cholera for four days Much vomiting and purging Izal given

29th August 1905 — Purging continued, but vomiting stopped

Evening — No improvement

30th August 1905 — No improvement

31st August 1905 — Died, collapsed

(54) 28th August 1905 — *Dulai* — Female, 6 years Ill for three days Usual symptoms General condition good Pulse fair Izal

29th August 1905 6 a.m. — Vomiting stopped Purging continued Izal continued

Evening — Improving slightly

30th August 1905 — Purging ceased Recovery uneventful

(55) 28th August 1905 — *Sulai* — Female, 10 years Ill three days Usual symptoms Izal

29th August 1905 — A little better Vomiting stopped

30th August 1905 — No purging or vomiting Recovery

(56) 29th August 1905 — *Sidha* — Male, 19 years Ill for four hours Usual symptoms Izal given

3 p.m. — Improving Character of stools changed

30th August 1905 — Improving No further trouble. Recovered

Such is the record of 56 cases, of whom 41 recovered and 15 died

It is possible that some of the cases were not cholera but care has been taken to exclude doubtful cases. Moreover, as we had some six hundred and fifty cases to deal with, we had little difficulty in recognising the disease.

I wish to again remark that I make no claim for it as a specific in cholera. All I claim is that in our hands it acted better than any other drug, and that the above-quoted cases show reasonable grounds for a further trial.

CATARACT EXTRACTION IN THE CAPSULE

[By J. C. S., OXLEY,

CAPTAIN, I.M.S.,

Officiating Civil Surgeon, Seoni, C.P.

After Major Smith's able article in the September number of the *Indian Medical Gazette*, it may seem presumptuous for any one of small experience to write on the subject of cataract extraction in the capsule.

It is, however, this very inexperience which may, I think, give some value to my remarks.

I think that many Surgeons, even in India, look on this operation as one only successful in the hands of experts of great experience such as Major Smith.

I wish to show by publishing my cases that it is an operation for all, and that the operation of scratching the capsule should be regarded as an obsolete procedure. It will, however, still have its place, of course, in certain special cases. These cases have been clearly defined by Major Smith.

I was fortunate enough to see Major Smith perform his operation last year.

Since my return to my district I have practised it systematically in all cases on which I have operated. The results I give below—

No of cases	Escape of vitreous	Capsule burst	Capsule left behind	1st class result	2nd class	Failure	Iritis
40	12	3	1	37	1	2	2

In this series there was no case of suppuration. Among the failures I have classed a man who, during my absence on inspection duty, left the hospital without permission. When I last saw him he had a good deal of conjunctival irritation but noritis. I was told, however, that his vision failed considerably, so I have classed him as a case ofritis and a failure. The other failure was due to the corneal flap getting displaced and turned downwards. The man had put on his *pagri* during the night and displaced the dressing.

The cases of escape of vitreous are rather numerous. In no case, however, was more than a grain lost, and I never observed any ill-effects in any of these cases.

The number of cases is of course, small as numbers go in India, but I think that as they are a true record of the experience of a junior surgeon undertaking this operation for the first time, it shows that no one need be frightened by the concluding warning of Major Smith's article "it is not an operation for the inexperienced." I may say that my previous experience of ordinary cataract extraction by scratching the capsule, was small and my results inferior to my present series. On any one undertaking this operation for the first time I would impress the value of certain points.

First discard the speculum altogether. From first to last the eyelids are to be retracted and held away from all contact with the globe, by means of the strabismus hook for the upper lid and a finger for the lower lid as described by Major Smith. In the course of the article referred to we are told that certain cases were lost through the patient shooting out the contents of the eye before the speculum could be removed. The author adds "the accident in these cases would have occurred in any operation." I venture to suggest that if the speculum is not inserted at all this accident is rendered impossible. I always operate in this way and find no difficulty whatever in making my incision, provided that the eye is drawn strongly downwards. I have had at least one case which I feel sure was saved by this measure. The patient was so extremely nervous that she held her breath and strained as if endeavouring to accomplish difficult defecation. The action of the orbicularis being entirely inhibited from the very beginning, the lens was extracted by a mere touch and the eye closed at once with a perfect result.

(i) *The iridectomy*—Although Major Smith states that he can extract the lens equally well without this measure, I strongly advise any one in his earlier operations to make a sufficiently wide coloboma. This very much facilitates the exit of the lens. Removing a piece of iris does not interfere with vision but leaving the capsule behind certainly does so. Talk of mutilation is nonsense. An iridectomy, properly performed, is not noticed by an ordinary observer at all.

(ii) In regard to expression of the lens, the great point is first do not be in a hurry, and secondly see that the edge of the lens presents truly in the wound, and does not get tucked up behind the upper lip of the incision. The first pressure should be a light touch exerted above the lip of the wound. If you find that the edge does not present at once and easily, you should temporarily remove all pressure from below and slightly increase the counter-pressure above, thus causing the wound to gape slightly. Another cause of failure is due to making the lower pressure too high up. The hook should be applied low down about half way between the pupil and the lower margin of the iris.

(iv) Although unnecessary fiddling is, of course, to be avoided, I find it necessary to very

gently stroke back the edges of the coloboma. If this is not done the cut edge of the iris is very often folded on itself or caught in the wound. If it does nothing else it interferes with the subsequent action of the pupil and makes the iridectomy more obvious. It may of course cause an elliptical pupil or even a cecoid cicatrix. I look upon iris incarceration, not amounting to prolapse, concerning which of course there is no question of its danger, as a very undesirable accident. It often delays the perfect healing of the wound and keeps the patient longer in hospital.

To still further retract the iris I always instil a drop of Escrine. In regard to this I would point out the very great advantage of the sterilised collyria put up in a small sealed glass tube called Ampoules, originally invented, I believe, by Dr. Damer of Paris. I have obtained a supply of these from M. Naline of St Denis, Seine, and have never seen Escrine irritation nor had a case of suppuration since I adopted their use. Another thing, and one not widely used I believe in this country, and which I have found of great use in certain cases, is Dionine. I generally instil a drop of this from an Ampoule on the first day after operation. It is well not to instil it until the wound has closed as it occasionally excites coughing. The effect of Dionine is to clear by its lymphagogue action any cloudiness of the cornea and by its analgesic action dispose of any disagreeable sensation of pain in the eye.

I have had two or three cases of staped Keratitis which have cleared up in a couple of days completely under this drug alone.

I may say that whatever the anatomical condition may be, I fully agree with Major Smith that the cause of staped keratitis after cataract extraction, is undue manipulation. It has nothing to do with antiseptic solutions. It only occurs when there has been difficulty in the extraction with consequently increased manipulation.

As it clears so quickly under a lymphagogue such as Dionine, I think it is really due to irritation. Folding of the layers of Bowman's membrane could hardly be influenced by applying a drug to the conjunctival sac.

At any rate Dionine is a specific for the affection.

I would urge the general adoption of this operation on the following grounds—

- (1) It is no harder than the old operation as my inexperienced hands have demonstrated.
- (2) It practically eliminates iritis as a complication.
- (3) The eye is safe in most cases on the third day, and one has never to watch for swelling of cortical masses, etc., which used not infrequently to ruin an eye which as late as the fifth day had seemed a success.

- (4) The patient can leave hospital much sooner. This is a very important advantage in many places where the ties of family tend to draw away one's patient in many cases long before it is safe to part with him.

CASE OF TYPHOID FEVER WITH A LARGE NUMBER OF COMPLICATIONS

By R. H. CASTOR,

MAJOR, I. M. S.,

Civil Surgeon, Bassein.

THE patient was admitted into jail on the 18th February 1905. He was admitted into hospital for typhoid fever on the 9th March 1905. Forty-six days later he was "discharged otherwise," and admitted for bilharzia hæmatobia on the 24th April 1905, and finally died of dysentery on the 14th May 1905.

Previous history—Nothing of importance.

Condition on admission—This prisoner reported sick with a temperature of 103°F. He stated that fever came on with no shivering, but he complained of lassitude, weariness, and pains in the limbs and back.

Respiratory system—There were no definite lung symptoms. No cough.

Circulatory system—There was a quick pulse (114) of low tension, and dicrotic. The heart sounds were weak.

Digestive system—Tongue was coated and dry, with red edges and tip. There was constipation. No other abdominal signs.

Liver normal, spleen, slightly enlarged.

Nervous symptoms—Headache and prostration.

Progress of the case *Fever*—For 22 days the fever kept high with very slight remissions, then fell to normal and remained so for 19 days. It again rose with remissions which varied from 98° to 101°, and then fell to normal again. There were no signs of lung complications during the whole course of the disease, except perhaps little dyspnoea due to emphysema. The heart sounds were always feeble, and the pulse often dicrotic. No signs of pericarditis. The chief symptoms were various digestive disturbances. The diarrhoea was of a pea-soup colour and was very offensive, and lasted for 14 days, then the bowels were normal. At the end contained mucus and blood. He often complained of exhaustion after passing stools, and on some occasions there was a good deal of straining. He also passed one round worm. The tongue was fairly characteristic of typhoid and the circumvallate papillae were enlarged. He vomited on two occasions. On the whole he took his nourishment well. Loss of sleep was a prominent sign. The face indicated mental torpor and dulness. There were no indications

of a liver abscess, and only at the end were the dysenteric symptoms noticeable. Frequent micturition at times, was prominent. Tympanites, tenderness and gurgling in the right iliac region at times were marked. The patient sank from exhaustion.

Clinical Microscopy

Urine was examined nine times, the average specific gravity was 1016. It was acid and contained albumen and mucus on two occasions. No sugar. Examined microscopically six times. Found nothing of importance.

Fæces were examined 41 times. Found ova of *ascaris lumbricoides* eight times. *T. Dispar* four times and *ankylostoma* twice. *Rhabdonema intestinale* eleven times, *bilharzia hæmatobia* seven times, and *amœba coli* four times.

Blood was examined 31 times, nothing of importance was found.

Diet—Peptonised beef tea, sago, milk, eggs, &c.

Treatment—Diaphoretics, intestinal antiseptics, stimulants, tonics, etc.

Post-mortem Examination

On opening the abdomen, a large quantity of sero-purulent fluid was found, 39 ozs of which were measured. It was reddish brown in colour, of a treacle consistence, and contained large flakes of lymph. Specific gravity 1014, and alkaline in reaction.

Brain—Healthy. Small amount of fluid in the ventricle.

Heart—Pericardium was adherent. The walls of the heart were pale and soft. Valves normal.

Lungs—Both emphysematous, otherwise healthy.

Liver—There was an abscess found in the quadrate lobe of the liver. The other lobes were free and healthy.

Spleen—Enlarged.

Stomach—One foot long. Normal.

Large intestines 4 feet 10 inches long. Throughout, the intestines were covered with small and large gangrenous ulcers varying in size from a four-anna piece to a rupee, and large portions of the mucous membrane were converted into black rotten sloughs. The sigmoid flexure and rectum were especially thickened and riddled with ulcers of the gangrenous type.

Small intestines 16 feet 8 inches contained several patches of congestion, and towards the ileum several small ulcers were found typhoid in character.

Vermiform appendix 4 inches long, healthy.

Bladder—The mucous membrane was healthy.

Pancreas—Normal.

Remarks—It will be seen from the history of this case that it was a remarkable one. The first signs indicated typhoid fever, later the following—nematodes were found in the fæces, *Ankylostoma duodenale*, *ascaris lumbricoides*, *trichocephalus dispar* and the embryo of the *rhabdonema intestinale*. One trematode the

bilharzia hæmatobia and one protozoa the *amœba coli*. Then dysentery (sero-purulent) and pericarditis developed. At the post-mortem a liver abscess of the quadrate lobe only was found. A diagnosis of Typhoid Fever was made for the following reasons. The onset was suggestive, and it is very probable the patient was unable to fix definitely the exact date of his illness. The steadiness of the fever was an important point, for one does not always see the gradual step-like ascent in the early stages, and even then it varies in its character. The diarrhoea was of a pea-soup colour, there was tympanites, abdominal tenderness and gurgling in the right iliac fossa. No malarial parasites were found in the blood. The complication of pericarditis and liver abscess found are exceedingly rare. The peritonitis was sero-purulent, somewhat reddish in colour and treacle-like in consistence. It was no doubt produced from intestinal infection. The liver abscess found was limited to the quadrate lobe. It was the size of a small orange and contained thick creamy pus. We know that single abscesses may be of dysenteric origin, and this is evidently a case in point, but in this lobe is very rare. Scheube states that out of 453 cases of liver abscess examined, only two were found in the lobus spigelii while he does not mention the quadrate lobe as being affected in any of them. It is remarkable that in this case it was limited to this lobe. *Bilharzia hæmatobia* is very rare. This is the first case recorded in this jail. The *Indian Medical Gazette* of April last states that the Sanitary Commissioner's Report of 1903 gives "no cases from among the prisoners in India." Although the portal vein, bladder, prostate and other parts were examined, the worm was not found. No ova were found in the urine. The patient had to micturate often, and complained of slight pricking pain in the penis, but there was no hæmaturia. The urine was examined several times. Scheube states the chief signs when this parasite is confined to the rectum are loss "of blood, pain and tenesmus and later a dysenteric condition sets in." These signs were noticeable in this case.

The *amœba coli*—This protozoa has been found in the fæces of healthy persons and also in those suffering from dysentery and diarrhoea. It is very probable that the liver abscess was due to this parasite, but unfortunately none were found in the pus of the abscess or in the walls of the cavity. The damage done by the *ankylostoma duodenale* was not great, except perhaps the petechiæ found in parts of the small intestines were due to it. The anaemia was not marked. We know that many persons harbour the *amœba coli* and *ankylostoma* without suffering from the slightest indisposition from their presence, but I have never come across a case in which no less than six parasites were found in the same individual, and will be glad to hear from others if this is an exceptional

experience My special thanks are due to Hospital Assistant Maung Nee for the care he has bestowed in keeping up the notes for this case *

THE ANATOMY OF PLAGUE BUBOES

By E F GORDON TUCKER,

CAPTAIN, I M S,

Civil Surgeon, Surat

The plague bubo as modified by its anatomical position—In the following description I follow entirely the work of Leaf† His book and especially the diagrams will be found most useful by anyone who has to deal with cases of bubonic plague

Buboes on the front of the thigh—The lymphatic glands of the groin consist of the *superficial* and the *deep* sets, and the superficial are again divided into the *horizontal* and *vertical* groups The horizontal consists of a line of well-marked glands which run along Poupert's ligament, they are either under or embedded in Scarpa's fascia at its junction with the deep fascia When a bubo forms in this group it is better to speak of it as an inguinal bubo Such buboes are almost always of the indurated variety But below this line of glands there may be two of the horizontal set, "one of which is most commonly in the angle between the long saphenous and circumflex iliac veins, and the other in the angle between the long saphenous and superficial external pubic vein" The lowest of the horizontal chain of glands is often subjacent to the commencement of the upper part of the scrotum, and a phlegmonous condition of the cellular tissues of this part may affect the spermatic cord The vertical chain consists of about five glands lying along the course of the internal saphenous vein, and of them two generally lie just to the outside of this vessel These two are in intimate relation with the two parallel branches of the middle cutaneous nerve Buboes among these vertical glands are almost always of the softening type, and in fact represent some fifty per cent of plague buboes In removing the sloughs from buboes which originate to the outer side of the long saphenous vein, the director or finger is certain to come in contact with the branches of the middle cutaneous nerve and cause a momentary twinge of pain The *deep set* vary somewhat in number and position, and, according to Leaf, are frequently absent entirely The most constant gland is embedded in the fatty tissue around the saphenous opening Of the glands which are definitely under the fascia lata, there are generally two, "the lower of which lies to the

inner side of the femoral vein entirely underneath the fascia lata, the upper lies in the same situation, but its apex may be found projecting just above the lower margin of the saphenous opening These two glands are often replaced by a single one about the size of a bean, underneath the fascia lata in the angle between the junction of the femoral and long saphenous vein" Fortunately, these glands when infected in plague are, at any rate in my experience, of the softening variety But the fluid often burrows among the muscular planes, and it then may be of advantage to make a counter-opening on the inner aspect of the thigh and draw a drainage tube through it to the anterior incision In connection with this group of glands there are sometimes one or two others in the crural canal, and these crural canal glands are in direct continuity with those of the obturator group The obturator group consists of a chain of two or four, which lie between the external iliac artery and the obturator nerve, and sometimes the "lowest member of this group is found projecting through the crural canal" In one case where I had incised and evacuated one of these deep femoral buboes, the man developed a hectic temperature and rapidly emaciated The wound was healing up and some time elapsed before fluctuation could be felt Then deep fluctuation was detected above Poupert's ligament On enlarging the wound I was able to get finger and dressing forceps under Poupert's ligament, and evacuated a large quantity of pus which had become shut off by adhesions, and speedy recovery ensued

Buboes in the popliteal space—The glands in the ham are usually very scarce, and their position and number inconstant This fact may explain the extreme rarity of buboes in this position Out of some sixteen hundred cases of bubonic plague, of which I possess notes, there was only one case of popliteal bubo These glands consist of superficial and deep groups, of which the latter lie deep, one group between the two heads of the gastrocnemius muscle, the intercondylar, and the rest at a higher level, the supracondylar The superficial group, if it should be called a group, is generally represented by one small gland, the size of a pea, lying in the superficial fascia and in close relation to the internal popliteal nerve The only interest or importance of the popliteal bubo is, that from its position when the patient is lying on his back, the existence of the mass may escape detection This, however, is not likely to happen unless the patient is semi-conscious, inasmuch as the intimate relation of the gland to the internal popliteal nerve will produce muscular spasm or contracture, and pain from involvement of the external popliteal Leaf points out that this gland is liable to suppurate in children from the presence of sores on the heel In one case which I had lately, of cellulocutaneous plague, where the site of the initial necrosis was on the heel

* The discovery of bilharzia hæmatobia in this case is worth of note Has any observer discovered other cases in Burma? ED—I M G

† The Surgical Anatomy of the Lymphatic Glands by C H Leaf, F R C S, London Constable and Co

there was no popliteal bubo, the inner femoral glands being alone involved

BUBOES INVOLVING THE HEAD AND FACE.

Occipital bubo—This is represented by one gland, the size of a pea, which is inconstant, but when present is situated about two inches from the external occipital protuberance. Buboos are very rare in this situation, but give rise to considerable pain in the head, as the gland generally lies directly over the great occipital nerve. The bubo usually sloughs out, exposing the occipitalis sheet.

Mastoid bubo—There are two glands which lie on the mastoid process just behind the pinna generally present only in children. I cannot recall any bubo in this position except in infants.

Parotid bubo—The parotid lymphatic glands, two or six in number, lie embedded in the substance of the salivary gland. They are, therefore, beneath the extremely tough and tense parotid fascia, and this fact renders the parotid bubo one of the most painful and distressing varieties in the disease. The existence of these buboes, occurring late in the illness, has perhaps given rise to the idea that suppurative parotitis is a rare sequela of plague. Involvement of this gland produces a tense brawny swelling, involving the whole of the same side of the face, and generally extending backwards and downwards to the anterior border of the sternomastoid muscle. The jaw is fixed, and the chin may be somewhat pulled away from the middle line. There is facial paralysis on the side of the lesion, and the contraction of the opposite muscles accentuates the lop-sided appearance that the patient presents. The pain produced by any muscular action of the tongue and jaw prevents speech, and the patient can only be fed slowly and with difficulty. The continuous agony that the unfortunate sufferer endures rapidly wears him out.

Morphia must be given hypodermically for these cases. Often two injections are required each day. The application of leeches, several times repeated and followed by fomentations, will give much relief. When softening occurs, the patient should be put under chloroform for the operation. Several incisions will be required to remove all the sloughs, care being taken to avoid the line of the facial nerve. An incision should always be made in the most dependant part, that is about the angle of the jaw, and a drainage tube inserted. Under careful treatment, these cases, though very distressing to watch, generally do well.

Buboes involving the neck—Cervical buboes are relatively much more common in children, probably because they put dirty fingers or dirty objects into their mouths. The prognosis of cervical buboes in children is fairly good, when found in adults, the prognosis is bad.

Submental bubo—This concerns two glands which lie on the mylohyoid muscle, immediately beneath the chin, one on each side of the median

line. They are rarely seen, and then mostly in children, and are of the hard late variety. When acutely inflamed the patient will have difficulty in swallowing.

Submaxillary bubo—This concerns the glands about the angle of the jaw, which are embedded in the substance or on the under-surface of the submaxillary gland. When involved in plague the upper cervical glands are also usually affected.

Buboes about the sternomastoid muscle—The lymphatic glands of the neck are all deep in the sense that they are beneath the deep cervical fascia. The uppermost glands of the cervical chain for the most part lie along the posterior border of the sternomastoid. There is one gland near the angle of jaw, which is very constant in position, being in the angle formed by the junction of the common facial with the internal jugular vein. A bubo involving this gland will therefore be felt anterior to the muscle. This gland is often infected, especially in children, and in these cases examination of the throat will often show a follicular tonsillitis. As many of these cases begin insidiously it may be difficult to distinguish the earliest stage from a case of follicular tonsillitis with consequent adenitis. Near this there is a group of glands in close relation with the internal jugular vein, and entirely covered by the sternomastoid muscle. They are also in intimate relation with the spinal accessory nerve. These are often infected in the case of children, and in them are most often of the softening variety, but the cedematous buboes are not uncommon. The lower glands of the chain are entirely under the sternomastoid muscle, and the intense pain of buboes in this region is related to their proximity to the nerves of the cervical plexus.

In the upper part of the cervical chain the glands approximate to the posterior edge of the sternomastoid muscle, and there are a few in the upper part of the posterior triangle of the neck. Hence these glands give rise to buboes which appear to be superficial to the sternomastoid.

Supraclavicular buboes—There are two to six glands about the omohyoid muscle or in the subclavian triangle. Buboes behind the clavicle are rare, but when appearing give rise at first to somewhat obscure symptoms as they are so deeply placed.

The treatment of buboes in the neck—The main point of interest in surgical treatment will depend on the relation of the bubo to the sternomastoid muscle. If they are below this, the muscle should be exposed in the whole length of the primary incision and a director worked through the fibres right into the substance of the gland and the whole broken up and evacuated. It is the general rule to find two or three glands matted together and in different stages of disintegration. When this is the case the adjacent glands can generally be reached by the director or dressing forceps through the one incision. Softening buboes of the neck generally do well,

especially in the case of children. The treatment of the œdematous bubo has been incidentally mentioned above.

Buboes in the axilla.—The constant groups of axillary glands are the *central*, four large glands which lie at the apex of the pyramidal space, the *subscapular* which lie around the termination of the subscapular vein, and on the dorsalis scapulæ muscle, the *pectoral*, some small glands lying behind the centre of the pectoralis minor, and the *infraclavicular*, which are found to the inner side of the axillary vein just below the clavicle and on the serratus magnus muscle. Only the two first groups are of any importance in the treatment of plague.

The central glands lie embedded in fat and loose connective tissue around an opening in the axillary fascia which Leaf describes as the Opening of Poirier, and which is analogous to the saphenous opening of the thigh. It may be an actual opening, or a potential foramen represented by a local attenuation of the axillary fascia. If the opening is present, it generally transmits the intercostohumeral nerve, which may be stretched across the bubo and explains the continuous gnawing pain. If the opening is absent, the glands may lie partly superficial and partly deep to the axillary fascia, and the deep glands will then be inseparable from the subscapular group.

In practice the central group will generally be found to be the one affected, and in the softening variety of bubo presents no difficulty. When the subscapular group is involved, the operator may be surprised at the depth from which sloughs can be evacuated, and the finger should be used to remove them from the surface of the dorsalis scapulæ muscle, the opening in the dome of the axillary fascia being well enlarged by dressing forceps for the purpose. The laxity of the cellular tissue around the central group explains the commonness of the œdematous bubo in this situation.

There are also occasionally to be found a few glands lying along the lower margin of the pectoralis minor, or between the pectoralis major and minor, and suppuration of these is not uncommon in plague.

Buboes in the arm.—An epitrochlear bubo is described in some books, but I have never met with one. The epitrochlear gland is fairly constant, and it is surprising that buboes in this position are so rare.

A Mirror of Hospital Practice.

A CASE OF OVARIOTOMY

BY J. C. VAUGHAN, M.B.

MAJOR, I.M.S.,

Superintendent, Campbell Medical School, Calcutta.

On the 26th October 1904 there was admitted into the Monghyr Hospital an old woman, named Augachin, suffering from what was diagnosed

to be an ovarian tumour. She said she was of about sixty years of age, but she appeared much older. She had been the mother of eight children, several of whom were dead, and at the time of her admission she had several grown-up grandchildren. I therefore conclude she could not have been under 65 years of age.

She had first noticed a swelling on the left side of the lower part of the abdomen about fourteen months before admission, and this had steadily grown ever since, and only once or twice has the growing swelling been in any way associated with pain. Gradually increasing, the growth has eventually come to fill up the whole abdomen.

On admission her condition was as follows—She was in weak health exhausted by the extreme physical inconvenience caused her by a large tumour of the abdomen in consequence of which she could not lie down at all and for weeks past had passed her days and nights in a semi-recumbent posture. On examination the bladder and uterus were found pushed down and the uterus itself is freely moveable. On percussion there was a distinct thrill through the tumour while a large grooved depression ran obliquely across its surface in the left hypochondrium—and other irregularities of the surface felt on palpation through the abdominal wall suggested a large multilobular tumour in the abdomen—possibly of ovarian origin.

The patient's condition called for early relief and she was eager for operation. Accordingly after a few days' preparation during which she wore an antiseptic compress over the front of the abdomen she was on the 2nd November placed on the operating table. I began the operation with a median incision about 5 inches long and introducing my hand searched for adhesions. The tumour was found to literally fill the whole abdomen reaching down into the pelvis and up under the arches of the ribs. Only two small adhesions were found, one of some 2½ inches of omentum and one a tag of organized lymph about an inch long from one of the coils of small intestine. These were rapidly dealt with in the usual way and the main cyst of the tumour punctured. This was placed anteriorly and contained about 250oz of ovarian fluid, the tumour still could not be removed and in getting at the second large cyst a smaller cyst burst. The second cyst was punctured and about 147oz of fluid were removed from it. Still the tumour could not be removed and the incision had to be enlarged past the umbilicus where a huge mass of cysts and the two sacs that had been emptied was drawn out of the abdomen. The pedicle presented no difficulties or peculiarities and was tied in three sections, and the peritoneum stitched over the raw end of the stump which was dropped into the pelvis. The abdomen was lightly washed out with warm 2% boracic lotion and the coils gently wiped dry and the abdominal wound closed with three rows of sutures.

The drain tube used was an ordinary rubber drain with few extra cuts in it in the usual way—the dressing consisting of a strip of protective overlaid with sterilized gauze over which again were large elastic pads of cotton-wool the whole, secured by a binder, which was prevented from rucking up on the abdomen by loops passing round the thighs. The solid parts of the tumour weighed 5lbs 2oz and the 397fl oz. of ovarian fluid weighed just over 22lbs and about 10oz of ovarian fluid were lost, some from the burst-cyst in the abdomen and some accidentally from the trocar tube. Altogether the weight of material removed was approximately 27½lbs.

The subsequent history of this case shews nothing remarkable. On the third day inclusive from the operation she vomited four times, and the dressings were opened and found to contain a small amount of perfectly sweet serous discharge. The rubber drain tube was shortened and the wound redressed. No further vomiting occurred after this. On the 7th day the wound was found closed throughout except at the opening through which the rubber tube had been introduced. This drain was now removed and at the next dressing on the twelfth day the wound was found closed altogether, and with the exception of a small but persistent superficial stitch abscess which duly healed, gave no further trouble. For the rest the history of the case subsequent to operation may be summed up as follows—

Pulse—Before the operation the pulse averaged about 84 to 90. During the 24 hours after the operation the pulse never rose above 100. On the second day, on the 8th, the highest pulse rates recorded was 108 once on each of these days, all the intervening records being between 90 and 100 and once 102. After the evening of the eighth day the pulse never rose above 96 and by the fourteenth day fell to 84, and subsequently averaged from 72 to 84, in the mornings and from 78 to 84 in the evenings.

The temperature—This was 98° a little subnormal before the operation. During the 24 hours following the operation it remained about 98.4°. On the second and third days it was 98° in the morning and 99° in the evening. On the fourth and fifth days it was subnormal falling as low as 97°, after which it averaged between 98° and 99° till the fourteenth day. At this time an irregular pyrexia set in lasting till the evening of the 25th day. This low fever averaged 98.8° in the mornings and 100° in the evenings from the fifteenth to the nineteenth day after the operation, and from 98° in the morning to 101° in the evenings till the twenty-fifth day after which it abruptly ceased on the exhibition of quinine.

After the twenty-fifth day there was absolutely no fever and I think the whole of this period of pyrexia was probably due to a wave of intercurrent malarial fever, as the patient never had any pain or other trouble and was otherwise perfectly well except for this curious evening fever.

Bowels and urine—Gave no trouble from the very first.

General strength—Was extraordinarily well maintained, and the patient was allowed to get up on the ninth day. She left the hospital on the 14th December, 42 days after the operation, walked half a mile to the station and straightway undertook a railway journey of 96 miles, with two changes of trains, involving some fourteen hours of travelling. She arrived home at midnight on a very cold night and sent me word a day or so later that she was very well. In May last, five months after the operation, I again heard of her to the effect that she was quite well and strong.

The most striking features in this case are the advanced age of the patient and the great size of the multilocular ovarian cyst removed, and the remarkably fine recovery for so aged a patient.

A CASE OF WOUND OF THE GRAVID UTERUS AND LACERATION OF THE SMALL INTESTINE RECOVERY

By R. F. STANDAGE,

CAPTAIN, I.M.S.

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I REPORT the following case as an instance of what can be done in the way of saving life, even after the gravest injuries, if surgical aid is promptly available. This woman was stabbed by her husband at 11 A.M., was brought to hospital at 11-10, was operated on at 11-20, and before 12 mid-day was back in bed, between blankets, with hot-water bags applied, and with every measure in use to counteract shock. Much credit is due to the police ambulance arrangements for bringing her so rapidly to hospital, and in hospital no time was wasted in getting her on to the operating table and her injuries put right.

Rupture of the gravid uterus is among the gravest and most fatal of abdominal accidents. This case may be classed with that condition, with the added intestinal and other injuries described in the following notes—

Govindamma, Hindu female, age 20, primipara, 7 months' pregnant, was admitted to the Lady Curzon Hospital on July 31st, 1905, having been stabbed in several places by her husband. There were four incised wounds—1 Six inches long passing horizontally outwards into the left flank, from a point half an inch above the umbilicus. This wound divided the whole thickness of the abdominal wall in its entire length, and through it the stomach and about 10 feet of the small intestine protruded. 2 Four inches long, just above the right costal arch, cutting deeply into the 9th intercostal space. 3 Three inches long, just below the angle of the left scapula, cutting deeply into the spinal muscles.

and exposing the vertebral transverse process 4 On the right breast, about one inch long The patient was in a state of profound shock, pulse 90 small and thready, sighing respiration, clammy sweating

She was taken at once to the casualty room, her own clothes, which were supporting the protruding stomach and intestines, were removed, and the mass of gut was enveloped in a loose pack of warm gauze covered with gutta-percha tissue She was then rapidly washed and taken to the operating room, where chloroform was given, and, after sterilization of the abdominal skin, a detailed examination of the abdominal injuries was made through the large wound The following was the condition — Stomach from cardiac end to pylorus completely extruded, but not wounded The protruding intestine was about 10 ft of the jejunum and ileum, and the jejunum was wounded at two points about 2 and 3 feet respectively from the duodenum The larger wound was about 1½ inches long, opening the lumen of the gut, and through it a large round worm was observed and removed by Spencer Wells forceps The smaller wound only cut the serous coat, and was about a foot further from the duodenum

The uterus was stabbed in two places, the bigger wound being on the fundus behind and parallel to the left Fallopian tube It was 2 inches long, went deeply into the muscle and bled profusely No liquor amni escaped, so it was presumed that the membranes had not been ruptured, possibly because the injury was over the site of the placenta The smaller uterine wound was parallel to the other, but in front of the tube, and was evidently caused by a second stab The Fallopian tube was also cut, the serous and muscular coat being injured, but the lumen was not opened

A large pad of gauze was pressed over the uterine wound and back into Douglas pouch to stop and absorb bleeding The protruding intestines were enveloped in a sterile sheet of gutta-percha tissue, and packed round with hot towels The perforated portion of intestine was brought out between folds of the towels and three continuous sutures were inserted to close the wound, (a) perforating through the mucosa, (b) perforating through all coats except the mucous, and (c) a sero-fibrous suture invaginating the other two A stitch was put through the serous coat, where the second intestinal injury had occurred

Stitches of stout silkworm gut, taking up the whole thickness of the divided uterine wall, brought together the wounds in the uterus, and an overlapping Lambert's suture of fine silk brought the peritoneal coat together over the knots of the deep sutures The deep sutures at once controlled the hæmorrhage which gave no more trouble,

The protruded intestine and stomach was carefully washed with warm sterile water, and by

lifting the abdominal wall, relaxed by the anæsthetic, the whole mass passed back into the abdomen easily The abdominal cavity was irrigated with warm sterile water, the edges of the wound were cut away, and it was closed by through and through sutures of stout silkworm gut The other wounds were made as aseptic as possible and closed, thus completing the operation which lasted 25 minutes

During the operation two rectal injections of brandy (1oz each) were given, and after 15 min of strychnine hypodermically with ¼ gr morphia Patient rallied well from the anæsthetic, the pulse and respiration improved she slept well during the night and was quiet till 11 A M, on the next day 4th July, 1905, she then complained several times of griping pain and discomfort in the lower abdomen On examination P V the os uteri admitted the finger and there was a marked sanious discharge Morphia was pushed, but at 5-30 P M, labour pains came on strongly, and at 6-30 P M she was delivered of a female foetus, which lived about half an hour Ergotin hypodermically No hæmorrhage

She vomited several times during the night, but was, on the whole, fairly quiet under morphia The pulse increased in rapidity, 124, but remained of good volume

On 5th July, 1905, vomiting continued, and became more frequent of a gushing character, bilious, and afterwards (at mid-day) distinctly fecal Bowels not moved No flatus passed Abdomen full, but not markedly tight or tympanic Not tender Mag Sulph one drachm every hour ordered Flatus tube passed high—16 inches—into colon, continuous irrigation with warm water, turpentine and assafoetida resulted after ½ hour passage of flatus and fecal matter Irrigation stopped Flatus tube left *in situ* Vomiting stopped, and was never again troublesome

From this time convalescence was uninterrupted Temperature remained normal throughout The bowels acted freely Pulse dropped to 90 on the 6th and 84 on the 7th and improved greatly in volume On the 10th the sutures were removed from all the wounds, and on the 23rd she walked out of hospital, and was able on the 24th to give evidence in Court against her husband, who, I am glad to say, got 5 years' imprisonment

I attribute the gratifying result in this case to the promptness with which the patient was brought to hospital, which allowed the operation to be carried out before the nutrition of the extruded abdominal organs was impaired I was quite prepared to re-open the abdomen for a rupture of the uterus at the site of the wound in the fundus during the activity of the organ when expelling the foetus It was a great relief and satisfaction to find that my fears were groundless, and that the deep silkworm gut stitches had sufficient hold to withstand the tearing effect of the uterine contractions

A CASE OF CHYLURIA WITH PREGNANCY *

By J C HOLDICH LEICESTER, M.D., B.S., B.Sc.
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MRS J R, Eurasian, aged 18 years, married eight months, came to the Out-patient Department of the Eden Hospital, Calcutta, on the morning of August 19th, 1904, complaining of great pain on micturition. On further questioning she stated that her urine was quite white, with small clots of blood, and that she had a swelling in the right thigh, which, at the present time, was not painful.

The further history obtained was as follows —

"She first began to pass milky urine on the day previous, *viz.*, August 18th, and was quite positive that before this her urine had been quite clear.

"The lump in the right thigh was first noticed in March 1904; it did not trouble her at first, but after a few days, any slight exertion, such as walking about, brought on some pain over the swelling. The application of belladonna and glycerine caused the pain and swelling to subside for the time. There was no fever in connection with the appearance of the swelling or afterwards. Towards the end of July, feeling weak, and noticing that she passed more urine than usual, and suffered from considerable thirst, she left Calcutta and went to Buidwan (about 67 miles away), but deriving no benefit, shortly returned. Noticing that her clothes were becoming looser, she believed that she was getting thinner. On August 18th, pain in the back came on, with great difficulty in passing urine. She was born in Calcutta and had lived there all her life."

As far as can be ascertained there were no cases of elephantiasis or chyluria, either in the house in which she lived, or in the neighbourhood. There was nothing of any bearing on the case, either in the past, personal or family history.

Menstrual history—Regular every four weeks, lasting six to seven days, rather profuse, but never passes clots. Pain just before the onset of flow. Last period ceased on November 26th, 1903. Has had a white vaginal discharge before, and throughout her pregnancy. No children or abortions.

On examination—She was somewhat anæmic. The uterus was found reaching up to 1½ inches below ensiform. Child was lying with the vertex presenting, the back being to the left and in front. Fœtal heart sounds were 142 to the minute.

There was a swelling, rather hard, but not very tender, over region of right femoral ring about the size of a walnut, which felt like an enlarged gland.

Urine drawn off with a catheter, milky white, with a pink tint, contains a good deal of white

sediment. S G 1022. Faintly acid. Albumin, $\frac{1}{4}$. Traces of blood. Chyle present. Phosphate in excess.

Microscopic examination of urine—Phosphates and oxalates present. Blood corpuscles, bladder epithelium and several filaria embryos. The urine partially clots shortly after passing, but soon breaks down again and remains fluid.

On the 20th the swelling in the right femoral region was very much less and could hardly be detected.

Labour pains began at 1 A.M. on the 25th August. The os was fully dilated, and the membranes ruptured 9-5 A.M. on the same date. At 9-40 A.M. patient was delivered of a live female child measuring 17 inches and weighing 5lbs 7 ozs. Placenta expelled at 10-10 A.M., weighed just under 1lb. There was a slight rupture of the perineum which was sutured with silkworm gut. Labour was otherwise normal. Temperature after delivery 99° F. Puerperium was normal except for a rise of temperature to 101.8° F at 10 P.M. on 31st August. With this exception the temperature never rose above 99° F. No cause could be ascertained to account for this rise.

On 31st August patient passed a little clear urine, early in the morning, for the first time since admission. S G 1020. Reaction faintly acid. Albumin, $\frac{1}{4}$. No blood or chyle.

On September 1st, the urine was milky white and tests the same as before. It remained in practically the same state up to September 28th, the date of discharge, with the exception that, that passed the first thing in the morning was frequently clear, or almost so. The amount of urine passed in the 24 hours varied very much from day to day. The average being 23 ozs, the maximum being 42 ozs, and the minimum 11 ozs.

The blood was examined on three different occasions between the hours of 9-30 to 10-30 P.M., and on each occasion was found to be swarming with filaria embryos.

The patient's weight on—

		Stones	lbs	ozs
September	11th, was	6	3	13
"	18th, "	6	4	8
"	26th, "	6	6	8

Treatment adopted—When first admitted, patient was kept in bed with the foot of the bed raised to elevate the pelvis. No medicine was given. The diet was milk and barley-water only. On August 23rd, the milk was reduced, and she was given bread, fish, chicken and chicken broth. No medicinal treatment. On August 26th, she was given milk diet, that is milk, tea, bread, sago and beef tea, and the usual hospital post partum mixture of ergot, digitals, and quinine.

On September 6th she was given eggs and chicken in addition to above, and gallic acid grains 10, three times a day. This was continued till the 12th, with no effect.

* This paper was communicated to the Obstetrical Society of London on March 1st, 1905.

On September 15th, in addition to the above, she was given rice and Fern Salicylate Mixture (this mixture was, I believe, first brought to the notice of the profession by the late Major Evans, I.M.S., for the treatment of this disease and has been found to very favourably affect certain cases) This was continued to the 21st, but without any effect

On September 21st, petrolum emulsion (Angier's) two drachms three times a day was prescribed (at the suggestion of Major F J Dury, I.M.S., who had used it with apparent success in one or two instances) and continued right up to her discharge on the 26th, on which date the uterus was well involuted and perineum soundly united

The case steadily resisted all treatment whether of diet, drugs or posture, and the condition of urine remained practically the same throughout The patient's general condition, however, underwent considerable improvement It may be of interest to add that the bladder was washed out with a solution of supra-renal extract twice a day after a preliminary irrigation with boric lotion from September 12th to the 15th, but with no appreciable effect on the amount of blood in the urine I think there is little doubt that in this case the pregnancy was the exciting cause of the chyluria, due to the disturbance of the pelvic lymphatics, which had been previously affected by filarial obstruction of the thoracic duct

My thanks are due to Lieutenant-Colonel F S Peck, I.M.S., for permission to record the case, and to the Clinical Clerk, Miss Flora Singh, for her careful and accurate notes

A CASE OF MALIGNANT ENDOCARDITIS TREATED WITH ANTISTREPTOCOCCUS SERUM RECOVERY

By F NORMAN WHITE, M.B. (LOND.),

Lieut., I.M.S.,

M.O., *4th Rajputs*

THE difficulties of arriving at a correct diagnosis in the early stages of the disease, the fortunate termination to a case in which the prognosis appeared so gloomy, and the part played by antistreptococcus serum in determining this favourable result combine to make the following case of more than usual interest

D Singh, a sepoy, *æt* 37, eighteen years' service, was brought to hospital on 24th August 1905, suffering from fever The fever, ushered in with a rigor, had come on during the previous night Only a fortnight previously this man had been discharged from hospital on that occasion he had been suffering from double otitis media No operative treatment had been undertaken, and he had left the hospital apparently cured With this exception there is nothing in the man's past medical history that has any bearing on the present illness

He has only had two very mild attacks of "ague" during the last sixteen years There is no history of rheumatic affections of any kind, nor any previous cardiac trouble

On admission his temperature was 103°F, the conjunctivæ were congested, tongue coated, skin hot and dry, and the pulse regular, of good volume, and low tension the arteries were slightly thickened There were no signs of disease in the chest the heart sounds were natural, and there were no added sounds The spleen was enlarged, three fingers breadth below the costal margin The blood was examined for malarial parasites with a negative result The following day the condition was much the same, the patient had vomited several times during the night and had been noisily delirious, the vomiting became very persistent as the day went on

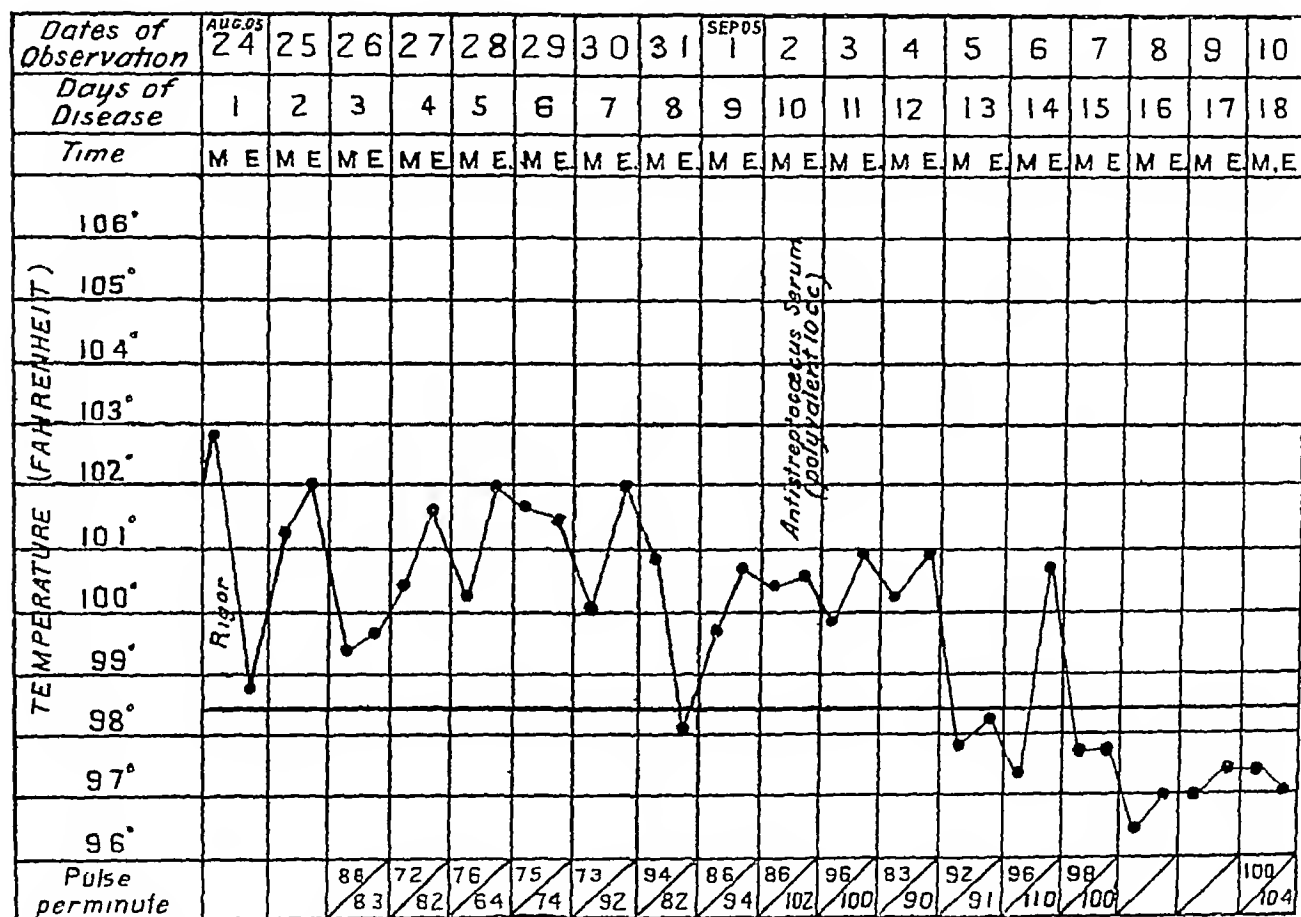
On the third day of disease his condition became much more serious He was only semi-conscious, and there was well-marked facial paralysis of the left side of the face the lesion causing this paralysis was a supra-nuclear one, the orbicularis palpebrarum and the frontalis muscles were spared, and emotional movements were comparatively well performed The onset of the paralysis was sudden There was very marked conjugate deviation of the eyes to the left, *i.e.*, towards the affected side There had been no convulsions Urine was voided involuntarily All the tendon and superficial reflexes were abolished, and there was no paresis of any muscles detected other than those of the face. The pupils were equal and reacted to light very sluggishly I was unable to obtain a good view of the optic disks There was no evidence of active ear mischief Later in the day the general condition improved somewhat, the patient partially recovered consciousness, and complained of slight pain in the neck and also of severe frontal headache There was slight rigidity of the neck muscles On examination of the heart a systolic murmur was heard at the apex At this stage of the disease an exact diagnosis was difficult or impossible, it seemed to me to lie between cerebro-spinal meningitis and malignant endocarditis in the latter case the paralysis could be explained by embolism Having in mind the recent attack of otitis media, one was naturally tempted to explain the facial palsy by neuritis of the facial nerve the palsy was however so definitely of a supra-nuclear type, that this diagnosis could not be entertained The possibility of a cerebral abscess had too to be considered, but it seemed almost incredible that an abscess involving by pressure the Rolandic area or the fibres proceeding from it, could cause so limited a paralysis as was present in this case, the conjugate deviation of the eyes, too, was in a wrong direction to give any support to a diagnosis of abscess the eyes were looking away from the supposed side of a non-irritative lesion (there had been

no convulsions) The suddenness of onset, the incomplete loss of consciousness, and the very limited extent of the paralysis, combined to make the diagnosis of embolism by far the most probable, taking these facts into consideration, the systolic murmur that had been heard on auscultation of the heart, at the apex acquired an importance that I should have not ascribed to it under other circumstances. The prognosis appeared gloomy in the extreme. If, as I suspected, endocarditis was present, it was certainly of recent origin, and almost equally certain of an infective nature, in which case infection had doubtless taken place from the middle ear. These considerations led me to think that an antistreptococcus serum (in the absence of defi-

ture had ranged from 100 to 102, and was remittent in type. The reflexes were still abolished, and Kernig's sign was present. The patient still voided urine involuntarily. The immediate effects of the serum injection were not marked, but sixty hours after, the temperature fell below normal, and with the exception of one evening rise to 100.6 it has remained down ever since.

At the present time the patient feels quite well. All symptoms and signs of disease of the nervous system have cleared up.

The cardiac dulness is increased in size, but the heart is well compensated. A rough systolic murmur is still to be heard, and this is much increased in intensity on the least exertion. A presystolic (? mitral) murmur is also to be



nite knowledge as to the exact nature of the infection) gave the patient the best, if not the only, chance of recovery. On the tenth day of disease I accordingly injected the patient with 10 cc of a polyvalent antistreptococcus serum. I obtained the serum through the Government Medical Stores, it had been prepared by Messrs Burroughs and Wellcome in London.

Up to the tenth day the patient's general condition had altered but slightly. He had recovered consciousness, and the facial palsy had improved, but the heart murmur had taken on characteristics tending to confirm the diagnosis, it was now musical in character, was heard loudest at the aortic base, and was conducted down the sternum and towards the apex where it could still be distinctly heard. The tempera-

ture had ranged from 100 to 102, and was remittent in type. The reflexes were still abolished, and Kernig's sign was present. The patient still voided urine involuntarily. The immediate effects of the serum injection were not marked, but sixty hours after, the temperature fell below normal, and with the exception of one evening rise to 100.6 it has remained down ever since. At the present time the patient feels quite well. All symptoms and signs of disease of the nervous system have cleared up. The cardiac dulness is increased in size, but the heart is well compensated. A rough systolic murmur is still to be heard, and this is much increased in intensity on the least exertion. A presystolic (? mitral) murmur is also to be

Indian Medical Gazette.

DECEMBER, 1905

NEW VIEWS ON MALARIA

NUMBER 19 of the *Scientific Memoirs*, a pamphlet by Captain S P James, I.M.S., entitled simply "On *kala-azar*, malaria and malarial cachexia," is more of a plea for scientific method in our investigation of the great problem of the differentiation of the continued fevers of India than an exhaustive treatise upon any one of them.

It is original, in fact, if we go further on the road our author points out, it is daringly original, for we take the logical outcome of Captain James' memoir to be that malaria is by no means the bugbear that the profession and the public have for centuries considered it to be, that in fact it is an exceptionally mild, and an exceptionally curable disease, and that if in our youth we only get enough of it, we become immune and it troubles us no more. No doubt this is a startling view, and one that will meet with the most fierce opposition as it is opposed to our most cherished ideas on the subject, it is opposed to the figures, which, on the strength of the village chowkidar's diagnosis, we have been for years piling up on the altar of malaria.

Let us see, therefore, what Captain James has to say in this pamphlet on this important subject. He begins by plunging *in medias res*, into the troubled sea of controversy which for sixteen or more years has raged around the question — Is *kala-azar* a form of malarial fever?

The first section of this memoir is devoted to showing by facts and personal observations that the line of argument in the following paragraph is correct —

"All observers agree that *kala-azar* is a very severe and, in the great majority of cases, fatal disease. If it be a form of malarial fever, it must then be a very severe and fatal form such as would only occur in intensely malarious places. It follows then that if we find *kala-azar* to be prevalent in places where there is very little malaria, and especially if it is prevalent in a place where malarial fever is not present, we may conclude that *kala-azar* is not a form of malarial fever."

We leave it to our readers to see for themselves how Captain James establishes this

thesis, we need only premise that, as should be usual in any discussion, we must define the terms we use, and Captain James means only by malaria the finding of the parasite in the blood of persons, chiefly children, and that he pleads all through for scientific method in the diagnosis of malaria.

On page 8 of his memoir Captain James gives facts which tend to prove a point on which his thesis depends, *viz* — That "natives who have resided during a number of years in a malarious place acquire an immunity to malarial fever." This leads naturally to the second section of this interesting pamphlet, where Captain James boldly proclaims, and gives much evidence for, his belief that "the notions hitherto held with regard to the signs and symptoms of malarial fever as it occurs among natives of India are erroneous," and if we had a clear clinical picture of what malarial fever really is, there would be little danger of its being confused for other (and more serious) diseases. Captain James' point is that "it has become thoroughly established that the signs, symptoms and temperature curves observed in patients suffering from recently-acquired infection are so definite and characteristic that it would be well nigh impossible for any one willing to investigate such cases carefully to confuse them with cases of any other disease."

This is a pronouncement somewhat upsetting to our preconceived notions, for it is a matter of common notoriety that many medical men think the signs and symptoms of malaria very indefinite and that "text book regularity" is practically confined to those somewhat dogmatic volumes.

We must, however, follow Captain James in his remarks on "chronic malarial fevers as they occur in the native of India", and this section we hold to be the most important as well as the most novel in the book before us. Captain James holds the view that the temperature charts of chronic malarial cases are not "irregular," and (using four-hour charts day and night) he shows there still remains the characteristic periodicity of malaria, so clear that a diagnosis might be based on it alone. He then gives a number of detailed clinical malarial cases, and contrasts them with cachectic cases of *kala-azar*. The malarial cases all have a certain group of signs and symptoms in common, the most important features being (1) enlargement of the spleen, (2) a temperature curve which shows definite pyrexial and apyrexial periods, and during the

pyrexial periods shows characters met with only in cases of malarial fever, and (3) absence of serious symptoms throughout the period during which the condition lasts, but especially so during apyrexial intervals

In fact, the tendency of malaria is to get well and instead of a malarial "cachexia," Captain James has described the method of acquiring immunity to malaria

We cannot at present admit that we are in agreement with this view, it is, however, a view well worthy of study. It must lead to a clearing up of views and to a reconsideration of the cases familiar to all of us which hitherto we have called malarial cachexia. In parts of India where the Leishman-Donovan infection exists, we may put down the cachectic cases to this cause, but in the Punjab where the Leishman-Donovan body has not been found in spleen cases we must surely admit that there are numerous cases of cachexia, wrecks in fact, a condition which most of us have attributed to chronic or neglected paludal infection. If these exist, as we feel sure they do, they must, according to Captain James' hypothesis, be other than malaria or a complication of previous malaria and other diseases. We may admit that a few of the cases, often hitherto called "malarial cachexia," may be, say, Bright's disease, or other form of diapsy, or they may be Banti's disease, or leukaemia, &c, &c, but still we cannot help thinking that some malarial cases must go to the bad, and that they cannot all acquire immunity. Possibly Captain James will admit this, and possibly, too, he will be able to point out that these are the rarer cases which we cure, for we must needs admit that many, nay the majority, of such cases die.

The rest of this interesting pamphlet is devoted to *kala-azar*, and is noteworthy for the excessive caution displayed by Captain James. Undoubtedly there is too much of a tendency at the present day to jump to conclusions, and hence we cannot but approve of Captain James' hesitation to admit as proved and certain the connection between the chronic cachectic state and the finding invariably in such cases of the body discovered by Leishman and Donovan. Captain James gives the impression that he is strongly in favour of the view that the Leishman-Donovan body is a real entity and the real cause of the chronic cachexia, and though he is perhaps too cautious, he has done a service in showing that this body has not yet been

actually proved to be so. The mere fact of its being invariably found in such cases is not sufficient proof in itself, we might as well go back and say that the ankylostoma is the cause of *kala-azar*, because it is invariably found in it, or the filaria perstans, the cause of sleeping sickness, because it is extremely frequently found in such cases.

We do not attach much importance to the reputed identity between the Leishman-Donovan body and an "indistinguishable" body found in oriental sores. Surely if there is anything in this view, which is *à priori* extremely improbable, the matter could be set at rest very soon by cultivation tests, as Rogers has shown us how to cultivate the Donovan body, and we may remember that some one recently has announced another "indistinguishable" body in cases of pemphigus contagiosus, and without attempting such cultures it was hardly worth raising the point at all.

We strongly commend this valuable pamphlet to our readers. It will meet with opposition we feel sure, but the method by which Captain James has approached his problem is sound and worthy of being followed up. The result may be that in time we will cease to regard the word "malarial," as applied to a place, as synonymous with "unhealthy," and it may be that the hecatombs of victims sacrificed to "malaria" in our statistical reports will be offered up in future on the shrine of some still "unknown" disease. It has been a matter of comment for years that malaria was only deadly in the *chowkidar*-compiled statistics, in places like, for instance, prisons, where usually accurate diagnosis and registration exists, malaria has always taken a very low position in the statistics of mortality.

Current Topics.

AUSTRALIAN EXPERIENCE IN FAVOUR OF THE FLEA-RAT THEORY OF PLAGUE

WE have received a report of 26 pages on the small outbreak of 12 plague cases which occurred in Sydney from 9th March to 10th September 1904. In India where we count plague cases by the thousand, we may well envy Dr. Ashburton Thompson, who is able so thoroughly to investigate these cases, and we are more likely to learn something of the method of the spread of plague by a thorough study of a few cases than a review of thousands.

As is well known Dr. Ashburton Thompson has always been a strong advocate of the flea as

the link between the infected rat and infected man, and the experience detailed in this report affords confirmation of the soundness of this view. Dr Ashburton Thompson writes — "Epidemic plague at Sydney has always depended wholly and solely on epizootic plague, and it has been successfully controlled there by measures directed, not at man, nor at the filth in which he sometimes lives, but at the rat alone. The plague rat is the source of infection for man to get rid of it is to stay the disease." In the year 1904 there was epizootic plague (among rats) from 1st March till 3rd December, so the human plague cases fell within the epizootic period. During the precedent plague-free period no less than 78,161 rodents were destroyed, and 18,456 were examined in the Laboratories at the rate of over 100 a day, and during this period none were found infected. During the nine epizootic months many thousand rats and mice were destroyed and no less than 43,822 were examined or about 182 rats daily, among these 243 were found infected. Plague was also found in one domestic cat. Of the 52,014 rodents examined over 35 per cent were *mus decumanus*, 14 per cent, were *mus rattus*, and 50 per cent *mus musculus*. The percentage of each species infected was very small, only 76 for *decumanus*, 116 for *rattus*, and 26 for *musculus*. Mice on the whole appear somewhat less susceptible to plague than rats. The following note tells of the species of fleas captured on rats at Sydney, the note being made by Dr F Tidswell, the microbiologist to Government —

"As opportunity offered during the year, individual species of rodent were searched for fleas. Such opportunities were not particularly frequent, as most often different species were put together in the same parcel, so that fleas from one might easily have become transferred to another. Collections were only attempted when the animals submitted were all of one species. The opportunities were still further narrowed down by the fact that often no fleas were obtained under these circumstances. However, the results of this part of the work were as follow —

TABLE I — 1904

Species of Fleas	M Decu manus	M Rattus	M Mus culus	Total
<i>Ceratophyllus (pulex) fasciatus</i>	1	3	6	10
<i>Otenopsylla (typhlopsylla) musculi</i>	9	5	17	31
<i>Pulex pallidus (cheopis, Rothsch)</i>	76	5	12	93

The 243 infected rodents were captured in 41 different premises. The twelve cases of plague in man came from eleven different dwellings.

1st case — Infected at place of employment, a produce store, patient said he had caught several fleas on his body and the premises were infected with fleas. Attacked

10th March, dead rats found in the store on several occasions in the ten days before attack, plague positively proved in dead rats. No other employees attacked.

2nd case — Employed at wharf, ate food there, attacked 10th April, home poor, but fairly clean, many infected rats found at and near place of employment. No further cases.

3rd case — Attacked 22nd April, worked at his own shop and store, flea bite marks on ankle. No trace of rats at residence, floor of store full of rats' holes, 83 rats caught, in 24 of which plague was identified. Store filled with canvas seed bags, recently landed at a wharf where infected rats had been found.

4th case — Lived fourteen miles from place of work, attacked 22nd April, no rats in residence, signs of past and present infestation at work-place.

5th case — Cartman, worked at wharves, attacked 26th April, numerous infected rats at wharf, none at residence.

6th case — Member of cleansing gang, attacked 12th May, had worked from 28th April to 5th May at place where fourth case had been attacked on 22nd April, infection probably caught at place of employment.

7th case — Attacked 25th May, worked at stores and employed in moving wheat, oats, chaff, &c. No signs of rats at residence, patient found and gave to rat-catcher two dead rats on day of and day before his own attack, these rats were found infected.

8th case — Worked at a paper mill, attacked 31st May. No infected rats found in paper mill, but some close by in another yard opening on to paper mill-yard.

9th case — A female, attacked 19th June, no rats found at place of employment, but numerous dead rats found at home, no rat caught living was infected.

10th case — Attacked 3rd August. Infected rats found abundantly at place of employment.

11th case. — A coachman, lived over stables with large stock of grain. One or two days before attack had killed rats in his bedroom. Plague found in rats in stable. Attacked 9th September.

12th case — At same house as previous one. Housekeeper, female, had attended on eleventh case when ill, attacked 10th September.

No other cases followed any of the other 10 persons attacked. Sydney experience is strongly in favour of disinfection, or rather "the most ordinary processes of scavenging and cleansing sufficed to banish the disease once and for all. Plague is not communicated to the soil, the soil does not communicate it to man, association between a locality and infection is a transient condition. By broad induction from, I think, a sufficiently large collection of data, it has been shown that the infection was not communicated from the

sick by direct or indirect (inanimate) agency, that it is must, therefore, have consisted in something external to man, that it was distinctly connected with locality, and that this connection was not persistent but transient. Consequently the source of the infection for man must be looked for elsewhere. Animated nature alone remains. Now, it is notorious that rats and mice alone among animals are specially susceptible of plague, and at the same time habitually infest the dwellings of man. The sole questions, therefore, which remain to be answered are whether connection between plague cases and plague-rats can be positively established in a large majority of instances, and, if so, how the infection finds its way from the rat (to which animal, no doubt, it primarily belongs) to man."

Dr Ashburton Thompson also adds that as regards inoculation by the flea, a good deal of circumstantial evidence exists, but nothing of a direct character, and the evidence still stands in need of examination on more exact lines.

Dr Thompson then sums up his experience in the following remarks, which as the etiology of plague must be essentially the same everywhere are of considerable importance—

"1 The disease was not directly communicated from the sick to the well—in other words was not "catching"

2 It was not communicated in any important degree, at all events, from the sick to the well by mediate channels (clothes, household goods, merchandise, excreta)

3 The infection attached to localities and spread to others adjoining and continuous with that in which it was first manifested

4 It also spread in a fashion which betokens the possibility of its being transported mechanically from an existent focus to a considerable distance, and there initiating an independent focus

5 In the buildings in any infected locality cases occurred irregularly, and showed no special proneness to occur in adjoining houses

6 When the occurrence of one case among the inhabitants of a building showed that the infection was present in it, secondary cases rarely followed. Irregularity of incidence on houses was accompanied with irregularity of incidence on the inmates

7 An epizootic disease among rats preceded the first case which occurred in man

8 This epizootic disease was plague

9 The area over which the epizootic extended was practically coextensive with that on which cases of plague in man were observed

10 The epizootic died out as far as can be learned, at the same time as the epidemic ceased

11 The epidemic was caused by communication of the infection from rats to man"

The rat is the *fons et origo* of infection, says Dr Ashburton Thompson, and the success which had attended the Sydney operations against plague shows what can be done when attention

is directed solely or chiefly against this undoubted source of danger

THE PATHOLOGICAL SIGNIFICANCE OF BALANTIDIUM COLI

It has been generally assumed that the infusorium known as *balantidium coli*, or as *paramacium coli* had little or no pathological or clinical significance, and when found in the human intestine it was treated as an accidental invader of little importance.

Such, however, is not the opinion of Dr R P Strong, the Director of the Biological Laboratory at Manila, an institution which since its but recent beginning has turned out much good work and is now well recognised in the medical and scientific world.

We recently (July 1905) gave numerous extracts from the Manila Laboratory Report on the significance of the amoeba in dysentery and just as the authors of that report pleaded for a fuller recognition of the pathological rôle of the amoeba, so now does Dr Strong plead for a recognition of the *balantidium coli*, "not only as harmful to man, but one which is capable of giving rise to a specific diarrhoea, which is often persistent in its course and not infrequently of a serious nature."

We may remember that thirty years ago, Normand found a small nematode in the stools of men suffering from chronic diarrhoea, but this parasite then called the *anguillula stercoralis* (or *rhabdonema strongyloides* of Leuckart), though often found has never been proved to have any certain pathological qualities, and we have been inclined up to now to regard the *balantidium coli* in the same light. We are not aware of the recognition of this infusorium in India, but its distribution is wide, and cases are reported from Germany, Italy, Sweden, France, Russia, the United States and the Philippines, so it is not improbable that it may also be found, if looked for, in India.

Man is not the only host of the *balantidium coli*, in fact the hog should be regarded as its proper entertainer, as the parasite is often found in great abundance in the colon and cæcum of that animal. It is also probable (says Dr Strong) "that man only occasionally derives it from the hog." It probable obtains access to the human intestinal tract either in contact with food or drinking water, as the encysted forms become dried and blown about. If, however, Klein's observation is correct that what he calls the *paramacium coli* is "almost always present in the sewage as it passes out of St Bartholomew's Hospital," it is probably very common in the intestines of persons visiting that hospital and therefore is not uncommon in London.

Dr Strong then gives in full notes of no less than 117 cases in which this organism has been found, these cases have been collected from the

literature of all countries and for almost half a century back, the first case having been observed by Malinsem in 1856. He also gives one good case himself, and refers to several other cases noted in Manila. It is noteworthy that the *Balantidium coli* have never been found in a normal intestine, though it may be remembered that but little research has been directed to the flora of the healthy intestine, but it is certainly remarkable that in the 117 cases quoted by Dr. Strong in all, but two diarrhoea or dysentery existed, and in one of the exceptional cases the parasite was found in the sputum. Dr. Strong considers himself justified in emphasizing the following conclusions —

"The presence of *Balantidium coli* in the stools is usually associated with diarrhoea, in which the faeces are generally liquid, often contain mucus, sometimes undigested food, and frequently blood. The diarrhoea is usually particularly persistent in its course until treatment is directed immediately against the parasite. Colic is a frequent symptom, and nausea and vomiting may occur. The abdomen may be swollen. It is frequently painful on pressure, particularly along the course of the large bowel. The colon on palpation is often thickened. Tenesmus is common. When the parasite has been present for long periods of time there is usually general weakness, exhaustion, and emaciation, more or less anaemia is then generally found and oedema of the feet and ankles may appear. The disease has been seldom met with in children (in but two reported cases). Twenty five per cent of the patients gave a history of having either associated with pigs or eaten or prepared fresh sausage."

TREATMENT OF ENTROPION AND TRICHIASIS

LAST month we published a paper by Major Henry Smith, I.M.S., on this subject. It may therefore interest our readers to learn of a method described as new, which is practised by Dr. Lagleyze of Buenos Ayres —

"For the past ten years, Lagleyze has practised exclusively in entropion, whether of the upper and lower lid, a method of his invention, which he has used in more than 300 cases without reproduction or injury to the normal aspect of the palpebral opening or to the lids. The operation does not require general anaesthesia, local anaesthesia is sufficient. He instils a few drops of cocaine solution over the globe and injects the same solution under the skin of the lid to be operated on, to the cocaine solution he adds adrenalin chlorid. The necessary instruments are a needle holder, a bistoury, a pair of scissors to cut the threads of the sutures, which are to be of silk, and introduced by means of a number of curved needles about 3 cm in length. For a complete entropion he employs six needles, for a partial entropion he uses a number in proportion to the extent of the entropion. After sterilizing the instruments, and making the region and field of operation aseptic, he proceeds to operate in the following manner: 1. The lid is everted in such a way that the limits of the superior border of the tarsal fibrocartilage are easily presented in the field of operation. 2. He inserts the needles into the conjunctiva, at the level of the tarsal superior border, slipping them between the fibrocartilage and the skin, so that they traverse the cellular tissue and orbicular muscle, and come out through the free palpebral border, at the level of the angle of implantation of the lashes. The needles should not be passed entirely through, but should be disposed so as to form a picture like that in Critchett's amputation. The needles should be spaced equidistant, it

being advisable to commence by placing the first in the centre, in order not to be preoccupied by maintaining the lid everted, then the others are inserted adjoining the centre until the angles are reached. 3. He incises the conjunctiva and the tarsal cartilage parallel to the border of the lid, approximately 3 mm from the free border, from one extreme to the other, if the entropion is complete. In partial entropion the incision must be made in proportion to the deformity, it being preferable, always, to extend the incision beyond the limits of the entropion. The incision is to be made with a bistoury, energetically, until obstructed by the needles, it being evident that a good result depends principally on a good division of the tissues. 4. He passes all the needles and uses a traction on each of them, so that the deep loops of the thread are adapted to the surface of the conjunctiva. Immediately after the withdrawal of the needles, the lid returns to its former position. The ends of the threads which issue from the palpebral border must be separated so as to obtain five loops, if six needles have been employed. The ends corresponding to each loop should be strongly adjusted to a small roll of gauze. Making the knots in this manner the free border is not damaged, the sutures are not lost in the ulcerated tissues, and consequently there is no difficulty in withdrawing them. The advantage of this suture is due to the fact that the loops are successive without solution of the continuity thus obtaining a number of loops equal to the number of needles employed, less one. The sutures are to be withdrawn in seven or eight days. The palpebral border, from the point of incision, takes a contrary direction, it is directed forward to such a point that if it is desired to exaggerate the effect, it may provoke a slight ectropion. The angle left by the incision forms a wedge which cicatrizes by second intention, filling the tissues with a new growth, and the length of the threads which maintain the corrective incurvation produces cicatricial lines which assist in the definite cure of the entropion." (*Ann of Ophth*, July 1905)

VENESECTOMY FOR RELIEF OF THE HEART IN PNEUMONIA

IN an admirable lecture on *Boldness in the treatment of Pneumonia* Dr. A. Monson of the Great Northern Hospital, London, writes as follows on blood letting for the relief of the embarrassed circulation in some cases of pneumonia —

"The last but not the least important point to which I shall refer in considering the bolder treatment of some phases of pneumonia is the question of bloodletting."

In the days of heroic venesection the object with which this measure was employed was the prevention or limitation of pulmonary engorgement. Inflammation was regarded as a purely mechanical determination of blood to a part, which might be prevented by opening a collateral tap in the circulation regarded as a hydraulic machine. Discouraged by the high rate of mortality in the disease under ordinary venesection, some advocated a greater boldness in blood letting, and bled, *coup sur coup*, repeatedly and largely, in the endeavour to effect by this means what a milder blood shed failed to do. But by the "jugulant" method, as it was called, our predecessors also largely failed, although statistics occasionally appeared to support each fresh departure. The general sense, however, was one of failure, and, like the pause after a great war, there was for a time so complete a truce to blood letting that generations of students grew up and were dispersed into practice with nothing less than a horror of blood letting in every form and under all circumstances. The public naturally, in time, took the same view, and he is a bold man who even to-day calmly proposes venesection in private practice in many cases, even although

all the indications point to its necessity. I recently met a *confere* in consultation, who told me that he had sent for me simply because he dared not himself bleed an urgently orthopneic patient with broncho pneumonia. We together relieved the patient of twelve ounces of blood from the arm at once, and with immediate benefit.

From what we now know of the nature of the pneumonic process we can understand why the bold preventive methods failed, as methods preventive of the progressive consolidation of a pneumonic lung, whether by bleeding or by ice, or by any other means at present known to us, are bound to fail. The particular attack of pneumonia with which we have to deal may be severe or may be mild, but being micrococcal in origin, the severity and duration of symptoms will depend upon the nature and virulence of the infective agent or agents concerned, although, no doubt, they are also influenced by the state of the inherent powers of resistance of the patient.

In the case of limited and easily accessible inflammations, such as otitis and pleuritis, associated with pain a local loss of blood may, we know, by relieving tension remove pain and reduce inflammation. But the argument from these facts to the more general effect of blood-letting on visceral inflammation has not been found in practice to hold good. Boldness, therefore, in endeavouring to oust the infective agent by venesection or to limit the pulmonary engorgement, is irrational. That will only be possible when we learn how to kill or stave the pneumococcus and associated organisms *in situ*, and in the general circulation, by some bactericidal or antitoxic serum.

The object of venesection like that of the application of ice, as I conceive it, is not to prevent inflammation of the lung but to maintain the effected action of the heart. It is directed against cardiac failure, not pulmonary engorgement, and it is only when cardiac failure is threatened that venesection is admissible. As moreover, such failure may occur more than once in the course of the same case, the same heart may have to be relieved by venesection one more than one occasion. The indications for the employment of venesection under these circumstances are—urgency in dyspnoea, with more or less dusky skin or cyanosis of countenance, usually accompanied with fullness of the superficial veins, and diminution in the size of the radial pulse.

The precise delimitation of the area of cardiac dulness under these circumstances is not always an easy matter. The intervention of the sounding board of the sternum, together with the accelerated rate of respiration, and the presence of adventitious sounds in the lungs themselves, make it difficult at times to determine with exactness the extent to which the dextral chambers of the heart are dilated. Fortunately, such accuracy of physical diagnosis is not necessary to guide us, for the more general effects already mentioned, produced by cardiac conditions, are sufficient indications of the state of the heart. It is probable that one reason why the large blood-lettings of the past were not even more fatal than they were, was the fact that venesection was practised early in the disease, when the patient's strength was frequently fairly good. Now that we regard the justification of blood-letting in pneumonia to be in the presence of signs of cardiac failure, whether these occur early or late, the scope of venesection in such cases is naturally much and properly restricted. Of blood letting late in a protracted case I have no personal experience. At this stage the diminished absorption of food from the digestive tract is, in itself, a mode of depletion *a tergo*, and any additional blood letting appears to be inadvisable. But, even under these circumstances, if the retrogressive stasis in the circulation appears to be a dominant factor in the situation, it is conceivable that venesection to a moderate amount may be permissible.

As regards the amount of blood to be withdrawn to procure relief, eight to twelve ounces, in presence of the signs of venous turgidity to which I have referred, may

suffice, and the more rapidly they are withdrawn the greater will the effect be. But the quantity abstracted must be regulated by observation of the effects of the measure upon each case, and the average quantities mentioned exceeded or diminished accordingly. In the case of children, a few leeches applied to the side, or in the right hypochondrium, may be sufficient.

A good deal of controversy of a theoretical nature has been raised as to whether any, and if so only a temporary, effect is produced upon the embarrassed circulation by blood-letting under these circumstances. That an effect is produced cannot, I think, be reasonably questioned. That it is only temporary may be admitted, provided, we also admit, that the more effective action of the heart which may ensue is maintained by other means, although initiated by blood letting. Nor is any thing except such temporary relief expected, desired, or necessary, as a result of venesection, to justify its employment. Relief is experienced by the patient and observed by the physician, and such temporary relief of distensive tension, coupled, as it should be, with the bold use of strychnine hypodermically administered, may be all that is necessary to restore force to the pulse and sufficient tone to the dilating chambers of the heart, to gain for the patient that reprieve from death which may make all the difference between the ultimate victory or defeat of his inherent forces over the processes of the disease."

THE SERVICES AND COLOUR BLINDNESS

UNDER the above title Dr. C. H. Walker writes as follows in the *Bristol Medical Journal* (September 1905) —

"On the 10th of April Mr. Arnold Forster stated that in accordance with the recommendations of the medical authorities, it had been decided to return to the former practice under which colour blindness was not regarded as a disqualification for a commission in the army. It is to be hoped that after this most sensible concession the other regulations as to eyesight in the army will be framed on a more rational basis. At present a candidate with a considerable degree of hypermetropia may be accepted, when it would be safe to predict that in a very few years spectacle would become an absolute necessity. The importance of recognising visual defects is far greater, of course, in the navy and mercantile marine. In June, 1904, the P and O steamer *Australia* was wrecked at the entrance to Port Philip Harbour. The pilot was found to have 30 D myopia and some astigmatism. His colour vision as tested by Holmgren's wools was normal, but "tested by luminous discs considerable illumination was required to elicit a satisfactory discrimination of some colours." A point of considerable interest is that the same pilot was in charge when, on March 10th, 1904 another steamship was wrecked at the entrance to the harbour! The Marine Board of Victoria has made the following regulation for pilots since this accident — "That the vision must be $\frac{5}{6}$ in each eye without glasses, and that the error of refraction must not exceed 1 D tested under a mydriatic colour vision is to be normal." It appears probable that the pilot in question had, as well as the myopia, some "shortening of the spectrum," that is to say, inability to appreciate the ends of the spectrum properly. Inability to appreciate the rays of lowest refrangibility at the red end would not be shown by Holmgren's wool test. This test, according to Edridge Green, is inaccurate as applied by the Board of Trade representatives. According to him about 40 per cent of those who appealed against their rejection were found to have been wrongly excluded. The "lantern test," devised by Edridge Green, has the advantage of detecting those who have a shortened red spectrum. A lantern is provided with thirteen slides, seven of coloured glass and the rest modifying glasses. The

chief feature is the use of two red slides, which look alike to the normal sighted, but one of which spectios copiously is both red and green, and therefore is seen as green by those who have much shortening of the red end of the spectrum "

THE question of the prevalence of hydatids in natives of India is raised by a correspondent in *Medical Missions in India* (October, p 85). We remember several years ago discussing this question apropos of a case published of a hydatid cyst in the liver of a prisoner in the Bhagalpur Jail. We then found that hydatid cysts are by no means common in Bengal, but they are very common in the Punjab, Madras and other parts of India. In Australia hydatids are peculiarly common, where (says Cleman) they are associated with the number of dogs employed on sheep-farming. In Egypt and Algeria hydatids are not infrequent, but are extremely rare in Canada and the States. Osler could up till 1891 find only records of 85 cases in Canada and United States and most cases occur in foreign immigrants. The prevalence depends upon the intimacy allowed to dogs as domestic animals and hydatids are extremely common in Iceland. In India, men of the sweeper caste, according to Norman Chevers, are chiefly affected.

THERE is some truth in the view of the Prussian cynic referred to in the following story which we quote from *The Sanitary Record* —

"Some cynical Prussian, amused at the feverish rush made in the direction of sanitation and orderly living under the dread of a cholera epidemic, has penned 'a hymn to cholera.' 'During the reign of slandered cholera,' he writes, 'many things new and good are seen. Drunkards shun beer, the dirty take to clean water, the sloven sets her house in order, laggard municipalities practise sanitation. Thou art the soul of philanthropy, the inspiration of great sanitary reforms, and the benefactor of our poor globe.' "

THE health of prisoners in the prisons of the Straits Settlements in 1904 does not appear to have been satisfactory. In the large prison at Singapore there were 52 deaths with a daily average strength of 902, or a rate of 57 per mille, in Penang with a daily average of 372 prisoners there were 11 deaths, or 40 per mille, at the small jail at Malacca it would seem that there were 7 deaths in a daily average strength of 46 or over 140 per mille per annum.

WE have received and hope to review in next issue an admirable book entitled *Military Hygiene*, published by Messrs Baillière, Tindall and Cox, and written by Major R Caldwell, FRCS, DPH, RAMC, whose useful and practical volume on *Prevention of Disease in the Field* we have already noticed.

WE direct attention to the memorandum which embodies several of the present regulations in

force in the Indian Medical Service. This is apparently written by the India Office with an eye to candidates, but even for them the case might be made much stronger, if the attractions of the civil side of the service, which is the side that brings in the good men from the schools, were more noticed. It is also somewhat misleading, as several of the statements as to method of reckoning service for pension do not apply to the older men already in the service.

WE again direct attention of men on Plague duty during the cold weather to our proposed special number in April or May next, on *How Plague is spread*, a prize of Rs 100 will be given for the paper adjudged best.

WE note in the Government of India Resolution on the statistics reported of the deaths from wild animals and venomous snakes that Government is contemplating the "question of introducing more generally the treatment of snake-bite by permanganate of potassium."

DR G G OZQUIER, of Tuin, Assam, writes to *Medical Missions* to call attention to the value of a drug called *Cronothus Americanus*, the structure of which in small dose he regards as a "sovian" specific for enlarged spleen.

ACCORDING to a German paper Koch has discovered that the spore of relapsing fever is conveyed from patients to other persons by means of the tick, or *orthorofus Larign*.

WITH reference to our request for information as to the prevalence of Malta Fever in India, we hear that there is strong evidence for the existence of this fever in Upper India, and we hope soon to publish facts in support of this statement.

Reviews.

Manual of Surgery—By WILLIAM ROSE and ALBERT CARLESS. Sixth Edition. Pp xiv and 1350. Illustrations 500, plates 30. Demy 8vo. Price, 21/- net, cloth, 25/- net, leather. London: Baillière, Tindall and Cox.

THIS manual is a new edition of an old friend, that even in these days of excellent text-books has made a name for itself as one of the very best. It is essentially a text-book and gives in each case a detailed account of what the authors consider the best line of treatment without confusing the reader with a multiplicity of shortly described methods.

Much new matter has been added both in text and illustrations, and the tendency to increase in bulk has been met by slightly

increasing the size of the page and quality of the paper

We are glad to see a new chapter on "The Blood in Health and Disease," now that examination of the blood for diagnostic and prognostic purposes is becoming more and more a matter of daily clinical routine, though we notice in this chapter, that for film examination Jenner's stain is recommended as being "simplest and most useful," and Leishman's stain which we think many of us in India will agree as being the simplest and most useful blood stain for routine work, is not mentioned

A new chapter has been written on Modern Surgical Technique, with detailed accounts of a sepsis, &c, which appears extremely sound without being fanatical

In abdominal surgery there is much both new and good, but we especially like the article on appendicitis

In the chapter on the Kidney we not only find some excellent skiagrams of stones but a detailed account by Mr. Reid of King's Hospital as to the methods by which such skiagraphic results are obtained

In the chapter on Bladder we are glad to see an excellent account of total prostatectomy replacing entirely the various other operative procedures at one time described for the treatment of enlarged prostate

A whole new chapter has been written on Gynaecological Surgery and makes the book more complete

The article on this or extra-uterine gestation is good, but while we think that the long accounts of differential diagnosis generally found in textbooks on this subject are waste of time and ingenuity, we should have liked to have seen a few of the more common mistakes such as abortion, salpingitis, appendicitis, mentioned in this connection, since such a mistake is not difficult to make and may be of fatal significance. There is much more that is both new and good, while that which is not new is as sound as it ever was, and we thoroughly recommend the book as one might a tried friend to those for whom it was written, viz, all students and practitioners of surgery

Plague in India.—A pamphlet by RAI BAHADUR LALA BAIJNATH, District and Sessions Judge, United Provinces

THIS is a useful and well written little pamphlet by a layman, who is now the Officiating District and Sessions Judge of Ghazipur. He has also availed himself of the aid and advice of Major B D Basu, FMS

The attention of the Rai Bahadur was drawn in Allahabad to the terrible death-roll of plague and to the ignorance of the people about it. He himself did much good work there in distributing medicine and giving advice to the people

We earnestly hope that this practical and useful pamphlet will be widely studied by our Indian fellow-subjects

For prevention our author bears testimony to the need of better ventilation and the need of fresh air and light in the houses of the people, to the need of better sanitation. He also shows that the voluntary evacuation of infected houses is most valuable, and where carried out with tact is soon appreciated by the people

We congratulate Rai Lala Baijnath Bahadur on the publication of the pamphlet, which we hope will be widely read

Poisonous Plants of all Countries—By A BERNHARD SMITH Bristol John Wright & Co, 1905

THE exact *raison d'être* of this little book is not easy to determine, and no light on this point is thrown in the preface

The volume, however, is a compact compilation of all known poisonous plants, the names and synonyms of all the plants are given, then toxic principles, the symptoms, and the treatment. The book has a good index, glossary and table of contents, and probably would be of considerable use to travellers and explorers in tropical countries

Elementary Microscopy—By F SHILLINGTON SMITH London, 1905, Baillière, Tindall and Cox Pp xii, 180 Price 3s

THIS is a very useful book and can be strongly recommended to all would-be purchasers of a microscope. It consists of chapters on the simple and compound microscope, on the stands, on objectives and eye-pieces, on various accessories, such as substage condensers, the Abbe illuminator, diaphragms, polarising apparatus, reflectors, light modifiers, &c, &c. We are glad to see the high opinion the author has of various microscopes by British makers, in spite of the hold that certain microscopes made in Germany have on our medical schools

Among the students microscopes recommended and illustrated are Baker's "D P H No 2," Baker's "Nelson Model No 2," Beck's "London," Beck's "Imperial," Ross' "No 1 and No 2 Standard," Swift's "Bacteriological Microscope," Watson's "Argus," Watson's "Fiam," Watson's "Royal." For research work there is Powell and Lealand's large microscope, Baker's "Nelson," and Beck's "Imperial"

Chapter VI deals in a clear manner, with the practical optics of the microscope, and all users of a microscope will read with advantage Chapter VII, on the manipulation of the microscope

We can strongly recommend this little volume, it is brimful of information about the choice and use of the microscope

Surface Anatomy —By T. GILLMAN MORPHID, M.D. (Dub). M.R.C.P. Pages viii and 150. Illustrations 23. Crown 8vo Price 4s 6d net. London: Baillière, Tindall and Cox.

THIS little book consists mainly of the course of lectures which the author was in the habit of delivering when Demonstrator of Anatomy. It is clearly written and easy to read, the illustrations are good and it contains all the chief points of the subject without giving a number of descriptions from different authors which more often than not confuse the student. The importance of learning the surface anatomy on one's own body is insisted upon. We can thoroughly recommend it.

Clinical Lectures upon Appendicitis, Radical Cure of Inguinal Hernia and Perforating Gastric Ulcer —By G. R. TURNER, F.R.C.S. Pages 136. Price 5s. London: Baillière, Tindall and Cox.

THE beginning of the book is occupied with a résumé of the author's results of his cases of appendicitis. As regards operation in acute cases the question asked is whether it is safe to leave the patient without operation and unless the patient is obviously getting well operation is performed. The gridiron method of splitting the muscles is not suitable for all cases, more particularly acute ones, on account of the small amount of room obtained by this incision. In acute cases if a swelling is present the incision is made over it, when absent one outside the rectus is preferred. A list of cases follows the first lecture, and the second is devoted to the consideration in detail of some of the more instructive ones.

A modification of Bassini's method of radical cure of hernia is preferred by which the conjoined tendon is sutured to Poupart's ligament in front of the cord, the external oblique being split before the suturing is begun. Kangaroo tendon is recommended as being the best material for deep sutures. The two lectures on perforated gastric ulcer comprise 9 cases with 8 recoveries, stress is laid on early operation, irrigation and free drainage. Too much care need not be expended on accurate suturing of the perforation if free drainage be arranged for. Most of the lectures have already appeared in the *Clinical Journal*. The printing, etc., is excellent.

Laryngeal Phthisis, or Tubercular Laryngitis —By RICHARD LAKE, F.R.C.S. (Eng.) Second Edition. By H. BARWELL, M.B. (Lond.), F.R.C.S. (Eng.) London: Baillière, Tindall and Cox, 1905. Pp. x & 120. With 45 illustrations (20 of which are coloured). Demy 8vo. Price 6s 6d net.

THE Second Edition of this excellent monograph has been brought out, enlarged and rewritten, by Mr. Harold Barwell, owing to Mr. Lake having given up the practice of Laryngo-

logy to pursue that of Otology. It is based upon an experience of 650 cases of the disease observed principally at the Mount Vernon Hospital for consumption in London. The etiology, pathology, symptoms, differential diagnosis, prognosis and treatment of the disease are very carefully and lucidly set forth. Several illustrative cases are detailed and reference to authorities are given throughout. Internal medication is omitted, as coming under the province of the general physician, and being fully discussed in works on general medicine. The local medicinal and operative treatment is fully dealt with, and the work bears the stamp of the practical surgeon on every page. The author's opinion of the curability of the disease when taken early and properly treated is the most hopeful we have met with.

Handbook of Intestinal Surgery —By LEONARD A. BIDWELL, F.R.C.S., Surgeon, West London Hospital. London: Baillière, Tindall and Cox, 1905. Pp. xii and 67. Illustrations 91. Demy 8vo. Price 6s net.

THIS book owed its origin to the establishment of a class in intestinal surgery at the West London Post-Graduate College, and contains a full description of the work done in that class. It contains a clear and complete account of the various methods of performing intestinal anastomosis, enterostomy, enterectomy, operations upon the stomach, intussusception, appendicectomy, &c. The last two chapters on the preparations before and the treatment after abdominal operations are lectures delivered at the Post-Graduate College and are republished from the *Clinical Journal*. They are full of practical directions and are among the most valuable chapters in a book that will prove of great use to the practical surgeon. The author avoids making incisions in the middle line as it is so difficult to obtain firm union of the fibrous septa, and he advocates dissecting the skin back off the rectus and dividing the anterior and posterior sheaths of the rectus in different horizontal planes. He never unites all the layers *en bloc* unless the patient is practically moribund, suturing each layer separately. Halsted's gutless sutures (silk), the two sheaths of the rectus with interrupted silk sutures, and the skin with silkworm gut—interrupted or continuous. The prevention of shock is attended to by avoiding unnecessary loss of heat, by the use of saline solution (avoiding purgatives just before operation and therein agreeing with Mummery in his recent excellent book on the after-treatment of operations) and by the use of ergot before and after operation. India-rubber gloves are reserved for septic cases.

The book forms a good supplement to a textbook on operative surgery, going into more details than is possible in a text-book, and will be found very useful.

ANNUAL REPORTS

BENGAL LUNATIC ASYLUMS

THE report is dated 19th April and is submitted by Colonel S. H. Browne, M.S., C.I.E., the then Inspector General of Civil Hospitals in Bengal.

There was an increase in the total number of lunatics, the daily average strength was 1,084 as compared with 1,053 in the previous year, of these 100 died. An exceptionally large number of lunatics were admitted from Saran district, possibly the stress produced by the plague sent this increased number to the Patna Asylum but there "is nothing in the statistics to justify the belief that there has been any important increase of insanity among the people." The ratio of insane (or rather we should say of the certified insane in asylums) in Bengal is infinitesimal when compared with that found in England, in Bengal the ratio is about 2.0 per 10,000, in England it is no less than 34. The number of death was 100 or no less than 92 per mille of daily average strength. These deaths in Behampore are attributable to bowel complaints 27 cases, tubercle of lungs 21 cases, and pneumonia 6 deaths.

The number of criminal lunatics was 556, a steady increase in the number of these criminals is observable since 1888, as usual mania is the heading under which a great majority are classified, 59 per cent. In English asylums the figure is about 41 per cent only for mania. One case supposed to be general paralysis of the insane was met in the Bhowanipore Asylum, this however being a European Asylum only emphasises the rarity of this disease (in which syphilis is supposed to have such a share) among the natives of India, as is true of the less civilised races everywhere.

As usual grinja is put down as the specific cause in a majority of cases and appears to take the place occupied by alcohol in European asylums.

Colonel Browne refers to the unsuitability of much of the present asylum accommodation, and it is to be hoped that the New Central Asylum proposed to be built at Ranchi may be pushed on, and when finished put in the hands of a specialist medical officer as has been done at Agra and at Lahore. A new central asylum for Europeans for the whole of Northern India is also desirable. There is much work of interest to be done among lunatics in India, and till asylums are in the hand of whole time specialists we cannot expect much progress. The education of medical students in lunacy is also a matter to be settled and the establishment of a large Central Asylum will facilitate this also.

ASSAM TRIENNIAL VACCINATION REPORT

THIS report shows that steady if slow progress has been made in vaccination in Assam during the past three years. The percentage of successful vaccination is given 98.8 for last season, anything higher than this on any large scale is not to be trusted. The revaccination figures range from 100 in three hill districts to 47.8 in Manipur while we agree with Colonel Wilkie that the range must necessarily in revaccination be wide, we would doubt results which show 100 per cent. success. It is satisfactory to know that in spite of opposition and in spite of the extensive and dangerous practice of inoculation vaccination is gaining ground in the hill districts. We may note that of the cases inspected by Civil Surgeons the percentage successful was no less than 97.7 an admirable result. It is said that the Lushais are given to sucking the vaccination wound immediately after the operation.

In the compulsory vaccination towns 71 per cent of the children "presumably available for vaccination" were protected.

The Vaccine Depot at Shillong has always been celebrated for the production of good lymph. Over 444,000 tubes were loaded in 1904-05 on the high average of 1,262 tubes per calf. The quality of the lymph was good as usual, and much credit is due to Major E. C. Hare, M.S., the Civil Surgeon and C. H. A. Kamal Chandra Dutt in charge of the Depot. On the subject of small pox inoculation Colonel Wilkie writes—

"The practice of inoculation appears to be prevalent only in the Surma Valley. It is rare in the Brahmaputra Valley, and unknown in the hills. Even in the Surma Valley people are beginning to realize the danger of the practice to the neighbours of the subject, and to adopt vaccination on account of his greater safety. Some outbreaks due to inoculation occurred in 1902-1903 in Sylhet and Cachar, and Major Wood found in some instances that the people acknowledged the connexion. It is probable that the time has come for forbidding the practice of inoculation.

Opposition to vaccination is mostly mild and yields to persuasion or an order from the district authority. But there are certain sects or tribes which have long been very stiff and consistent in their opposition, such as the Mahopurushyas,

the Mutticks, the Thakmas, the Bhakats, the Kacharis, the Lalnugs. However, in 1903 and 1904, the Lalnugs of Nowgong made a beginning, and in 1904-1905 the Mahopurushyas and Mutticks of Sibragi allowed their children to be vaccinated, and a number of the Kamrup Mahopurushyas also gave in. Some of the Khasis fear to offend a god by adopting vaccination, and the Mutticks in Sibragi were for the same reason afraid to take measures against either small pox or cholera. The hill tribes, except the Garos, are still shy and distrustful of the process. But among the Mikirs the aid of the missionaries has enabled some work to be done.

On the 14th April 1905 the sub-inspector at Silchar found that out of 209 school boys, 33 per cent had been inoculated, 65 per cent had been vaccinated, none had had unmodified small pox and 1 per cent were unprotected. The corresponding figures for 27 dispensary patients were 37, 18, 22, and 22 per cent and for 50 prisoners 42, 27, 22, and 8 per cent.

A certain amount of falsification is practised by the paid vaccinators, especially towards the close of the year, when making up their final returns, and some have been dismissed for it. The licensed vaccinators are believed not to be under the same amount of temptation.

A desirable reform would be the substitution of approved Hospital Assistants for the present Inspectors of Vaccination. They are better educated, have more influence, know better what they are doing and can treat the children as patients and not simply as subjects to be vaccinated. They would also be able to afford here and there medical or sanitary aid or advice, and to check the records of vital statistics in a superior manner and improve the diagnosis for the death returns.

The Local Government has under consideration a scheme for the prohibition of inoculation.

VACCINATION IN BENGAL

THE sixth triennial report on vaccination in Bengal is submitted by Captain W. W. Clemesha, M.D., D.P.H., the official Sanitary Commissioner. The figures show a satisfactory increase of vaccinations in the province as a whole, but a falling off of vaccinations done in dispensaries, small municipalities and in the City of Calcutta. The falling off in Calcutta is very bad, as only one quarter of the infant population was protected by vaccination in the year 1903-04. We quote Captain Clemesha's views *in extenso* on the causes that bring about fluctuation in the district returns year by year.

Those that tend to aid vaccination—

- (i) An epidemic of small pox, this in most districts very much improves the quantity of work, vaccinators, inspectors, executive officers all bestir themselves and revaccinations greatly increase. There is almost always a decrease in subsequent years.
- (ii) Improving the inspecting staff of any district, visits of Deputy Sanitary Commissioners, pressure from head quarters, etc.

Those that tend to hinder vaccination work—

- (i) Epidemics of plague, this is a very important factor, if it is the first epidemic. As the disease reappears regularly at certain times, it affects the work less.
- (ii) Unhealthy years generally, —indeed this year's figures of Rangpur, Rajshahi, Jessore, etc.
- (iii) Years of scarcity and famine, the 2 anna fee is more of a hardship than usual.
- (iv) Advent of a new Inspector, this seems paradoxical, but it is not at all uncommon to find that a change of staff produces an increase in the actual work of the district but a falling off in the figures due to the new man putting a stop to the "cooking" of returns by the Sub Inspectors.

On this the following remarks are made in the Government Resolution—

"There is no correlation between the number of operations and the varying prevalence of small pox, and the greatest success has been attained in the tracts which are least afflicted by that scourge. The Sanitary Commissioner is of opinion that an epidemic of small pox leads to a larger number of vaccinations, but although such a result might be anticipated it is not borne out by the statistics, nor are the figures to be explained by the reputed attitude of the people towards vaccination. The Fezzis of East Bengal are said to be exceptionally hostile, but this is precisely the part of the Province where the greatest success has been attained. The backward state of the work in Shahabad is attributed to the character of the people, but it is almost equally backward in Patna, where the inhabitants are supposed to be less obstructive.

The real factors affecting the results are doubtless the efficiency of the staff, the degree of supervision exercised by the Civil Surgeons and the officers of the Sanitary Department.

ment and the interest taken in the work by District Officers. The Lieutenant Governor notices that the improvement which took place last year in Midnapore, Cuttack and Noakhali is attributed to the active co-operation of the District Officers, while that in the Tributary States of Orissa is accounted for by the supervision exercised by one of the Deputy Sanitary Commissioners. The Sanitary Department is now at its full strength for the first time for some years and Sir Andrew Fraser hopes that this will lead to a marked improvement in the outturn in the more backward districts. District Officers will again be asked to do what they can during their tours to promote the cause of vaccination by enlisting the sympathy of the people with whom they may come in contact and by taking a personal interest in the work done by the vaccinators.

The question of making the vaccinating staff more efficient has recently engaged the attention of the Lieutenant Governor. Proposals for raising the status of the inspecting officers have been submitted to the Government of India, and a system of rewards to vaccinators has been introduced. A scheme for the better training of the vaccinators and inspecting staff and for the more extended use of calf lymph is under consideration.

The recent rules by which officers joining the Sanitary Department are bound to remain in it for several years is altogether good. No possible progress could be made when on the first emergency a Deputy Sanitary Commissioner was taken away and when the changes in the staff of the Department were as many as the months in the year.

Correspondence.

THE EPIDEMIOLOGY OF PLAGUE

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR—There is still much mystery attaching to the etiology and epidemiology of plague and to the method or methods by which the bacillus usually enters into the body of human beings. In an article that appeared in the *Journal of Hygiene* for January 1905 on the epidemiology of plague, written by Mr. Hankin, the writer contends that the disease was probably introduced into India in 1896 by fakirs from Garhwal. He maintained that the outbreaks of 1912 and of 1916 were due to the transit of the germs of mahamari to Nasik by fakirs, and when it was suggested by some one at a meeting later on that these men wore little or no clothing, he said the germs could be carried in the long hair which these men wear. As this was long before railways were introduced in India, these fakirs must have travelled to Nasik on foot. It seems to me inconceivable that a man could carry plague to Nasik and Paki on foot in his hair without distributing it to places en route and why such a theory should be advanced in the case of Bombay, connected as it is so intimately with China, is difficult to understand. When we observe how plague is spreading in recent years by sea and land to places so far distant as Glasgow, Sydney, South Africa and South America, it seems unnecessary to imagine anything so unlikely as introduction into Bombay from Garhwal by fakirs, since by means of ships, rats and the transit of clothes or goods in railway trains plague can be conveyed all over the world. As hill plague was common in the decades from 1846 on if carried by fakirs it ought to have visited the plains before 1896, as railways, one of the chief modes by which plague spreads, were introduced long before that year. In 1853-54 mahamari did descend to the plains and from Thakurdwara and Afzalgarh in Moradabad spread to Rampur causing 8,000 deaths. This we have from the records. In this instance, as I pointed out in my mahamari report (Report to Government of India United Provinces, Sanitation Department, Proceedings for June 1902, also *Indian Medical Gazette* July 1902) hill people undoubtedly brought it from Garhwal to the bazaars at Chilkia and Kashipur from whence it spread, but it is the only case on record of mahamari spreading to the plains. It did not invade India, and moreover, like true mahamari, it did not recur in the following year as plains plague does. The above towns are in the Terai and are likely places to be infected from the hills. Mahamari does not occur in the foot hills of the Himalayas but more in the interior—some 30 or 40 miles or more distant from the foot hills. After an acquaintance extending over some years with plague, I believe mahamari and plague are the same disease with epidemiological modifications and idiosyncracies, but both culturally and clinically they are alike as I have myself observed in the laboratory and in Garhwal. But epidemiologically there are peculiarities. In mahamari, for instance, the same village is rarely or never attacked two years in succession. This has been noticed frequently (see Appendix C Mahamari Report). Mahamari after attacking a village rarely recurs in the same village until 10 or 15 years have elapsed, whereas plains plague almost invariably returns for

a succession of years. Of the outbreak of hill plague at Thakurdwara and Afzalgarh (in the plains) there was no recurrence in the following year the disease dying out. Mahamari has not occurred in Baransi in Garhwal since the outbreak I visited in 1902. In the plains of India plague recurs, as already stated, year after year in the same town or village not through reimportation, but I believe by germs remaining dormant during the hot weather and later through some process at present unknown becoming active.

The fact that in mahamari many instances occur where rats are not infected will not account for it altogether, as in about half the outbreaks in Garhwal rat mortality is observed. If it is true that mahamari has only on one known occasion spread to the plains, I am not aware that except for isolated cases plains plague has ever spread to the hills. There is no instance so far in these Provinces, in spite of the close connection of Nain Tal and Mussoorie with the plains. I believe the disease has never yet taken root in the Simla hills in spite of the severe visitations the Punjab is annually subjected to.

Dr. Klein has asserted in the Annual Report of the Medical Officer of the Local Government Board (1903-04) that there are two types of B. Pests in the rat of different stability, the bacillus of the human type is highly pathogenic to rats, that of the rat type only slightly so—the former retains its virulence in subcultures, while the latter soon loses it. He found that it was possible to diminish the virulence of the human type as to cause it to approach very nearly to that of the rat.

Mr. Haffkine and Mr. Hankin found that there was no apparent bacteriological differences in the cultures of mahamari that were submitted to them by me. Rats refused to succumb to the original culture but this culture was very old and had become very attenuated. When grown in peptone broth the bacillus resumed all its usual characteristics.

If what Dr. Klein maintains is true, it should not be impossible to exalt the rat type of plague to approach that of the human type, and it is not improbable that something like this may actually occur in nature. It would account for the long delay that occurs—especially in mahamari—before human beings are attacked.

J CHAYTOR WHITE, M.D., D.P.H. (CAMB)

MAJOR, I.M.S.,

Offg. Sanitary Commissioner, United Provinces

PROSTATIC ENLARGEMENT IN NATIVES OF INDIA

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In answer to Mr. Martin Newton's letter in the *Indian Medical Gazette* of October, I may state that in the last five months I have done two operations for enlarged prostate.

In both cases the prostate was removed by Feyer's Method. They both recovered, and have complete control over the bladder.

Yours &c,

R J MARKS, MAJOR, I.M.S.,

SAHARANPUR, U P

Civil Surgeon.

CASES OF PLAGUE AMONG ANIMALS

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—In connection with Lt Col Crawford's Report on the Plague Epidemic in Hughli Chinsiva Municipality in a recent issue of the *Indian Medical Gazette* about plague in animals, it may, perhaps, be interesting to note that cases of plague were said to have occurred, and in some cases swellings have been observed in cows, buffaloes, goats, fowls, cats, dogs and jackals, besides rats and squirrels in the villages in Ambala district. Jackals in the vicinity of plague infected villages were said to have been seen lying dead in numbers in the fields. In only two cases did I, myself, observe cows, who, on the first day began to walk lame, could not walk or eat anything on the second and died on the third. Both cows belonged to the same house, the other cow being attacked a day after the attack of the first.

Strange as it may appear, the villagers seem to think that a plague Doctor knows how to treat animals, though they don't seem to have much confidence in our treatment of human beings in plague cases. There was an indistinct swelling in the groin of both cows, but I am not in a position to say definitely that there was an enlargement of the glands. It may have been mentioned that more rats were found dead in cattle sheds during the recent rat-destruction campaign in this district and the villagers declare that rats are in the habit of sucking cowdung. Plague among rats in the cattle sheds may, probably, infect the cows and buffaloes, who are shut up in dark, low, *kuacha* houses during the night.

The other cases among cats and dogs may be said to be cases of plague in so far as they occurred in infected houses and died after being "out of sorts" within two or three days, no such animals being found sick in uninfected houses in the same village and at the same time. Cases like these are no doubt rare, but one occasionally hears of such attacks as to go from one village to another.

Unusual mortality among rats, in the majority of cases, precedes an epidemic of plague in a village as pointed out by Major Blowning Smith in the September number of the *I M G*, but in some cases it has been observed that the disease seems to die out after the rat mortality without any epidemic among human beings. This generally happens when the village is evacuated at once, the villagers now knowing this from previous experience, to be the best course. When, as it generally happens, some villager, such as the village *Bania* goes to his shop in the village, once daily, after evacuation of the village, to get something, mortality among squirrels have been seen to occur near the temporary thatched huts at a little distance from the village below some big trees. The origin of infection of squirrels in such cases is probably the infected grain and clothing, &c., which the *Bania* brings from his village shop, where rat mortality occurred a few days before.

Plague among cats may be said to be due to their devouring infected rats, though it is generally held that a cat by instinct, does not devour an infected dead rat. The settling of the rat mortality on such domestic animals, as cats, dogs and fowls, is probably the best explanation for the incidence of plague among such animals, as it is for plague among human beings.

Yours, &c.,

S C ROY, L.M.S.,

Asst. Surgeon on Plague Duty, Ambala Dist.

THE PRATT OPERATION FOR HYDROCELE

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—With reference to "Hydrocele's" letter in your October number about Doyen of Reims in Franco having performed an operation for the radical cure of water in the tunica vaginalis of the testicle by eversion of the sac and his being followed by Von Kelmán in 1893, allow me to say that Lieutenant Colonel Pratt was not aware even of the existence of Doyen or his operation.

The idea was originated and acted upon first in Asia by Lieutenant Colonel Pratt independently of anybody else, and surgeons in India and other places where this practice has been followed are indebted to him.

I was for several years associated with Colonel Pratt as his Assistant and was present when he first performed the operation in 1896.

Yours, &c.,

MUNNA LAL,

Civil Surgeon, Ballia

October, 1905

IXORA IN DYSENTERY

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—I beg to ask the favour of your publishing the following lines which contain additional facts and information in connexion with *Ixora* and which have not been published in the *Indian Medical Gazette*.

It will not come into general use if trouble is not taken to spread its cultivation in hospital compounds and gardens or in other places. As *Ixora* is a beautiful ornamental plant, it may be cultivated for medicinal purposes as well as for the beauty of its flowers. Those who want to cultivate the plant may get a supply of it, gratis, by applying to the Superintendent, Royal Botanical Garden, Shimpoor, who (in his D.O. Letter No 178 of 5th May 1903) has kindly consented to supply the plants to them who would cultivate for medicinal purposes and would bear the cost of carriage.

The Inspector General of Civil Hospitals, Bengal, has written to me (in his letter No 1403, dated Darjeeling, 19th June 1905) that a stock of Tinct. *Ixora* has been prepared and kept ready at the Medical Store Depot, so that medical men may obtain a supply of the drug from the depot and may give it a fair trial.

It must be remembered that when dysentery is complicated by fever or any other disease and when distressing symptoms appear, they should be treated by other appropriate medicines which do not interfere with the action of *Ixora*. *Ixora* is the main remedy for dysentery only, but it cannot supply other wants, just as Quinine is for fever only and not for all complications during an attack of fever, in which the administrations of such medicines as castor oil and mild saline aperients, diaphoretics and diuretics, &c., are required to preserve or restore the action of the bowels, skin, liver, kidneys, &c., Quinine also may be required to check the fever.

Salparny (Hedy Saruni Gneticum) is another remedy for dysentery of moderate severity. It is a common indigenous plant (which I brought to the notice of the medical profession in the *Indian Medical Gazette*, 1st March 1879). It is a cholagogue and acts like mild saline aperients in dysentery cases, altering the character of the stools in a short time, the stools become loose, bilious and feculent, blood and slime disappear and with them griping and tenesmus pass away. The drug is quite innocuous and belongs to the natural order Leguminosae. Recent authors, such as Brigado Surgeon Dymock, Dr Warden and Dr Hooper in *Pharmographica* (published in 1890, Bombay,) call it *Desmodium Gangotricum* (Salparny) have described its therapeutics and that of *Ixora cæcinea*. It should also be cultivated to a large extent. The value of the drug Tinct. *Ixora* and Salparny (Salparny root) will be realized if they are used in acute bloody dysentery cases only, and therefore should not be administered in cases where pus, sloughs, shreds of mucous membrane appear in the stools and where ulceration is suspected and in diarrhoea cases. The dose of Salparny root is 30 to 40 grains to be taken twice or thrice a day. Careful dieting with liquid farinaceous food, such as sago, arrowroot, barley and milk and careful nursing and rest and hygienic conditions should be observed. Solid food must not be used at all. Bad cases and general health &c. of the patients should be noted. Disinfectants should be used in bed pans and the bed rooms.

Tinct. *Ixora* forms a good combination with Tinct. Opium and water in dysentery cases.

Ixora was tried in the Campbell Hospital in 1904. In all the cases numbering 25 the character of the stools changed within a short time of its administration. The stools became feculent, bilious, blood and slime disappeared. In some cases, light diarrhoea commenced as when Ipecacuanha was used and which was salutary in such cases. Diarrhoea should be treated by other medicines, and *Ixora* should not be continued till death.

I earnestly solicit the members of the medical profession to take an active interest in the new remedies I have mentioned for, without their co-operation and help, such valuable medicines will not come into general use and suffering humanity will not derive the benefit they obtain by using the drugs in acute bloody dysentery cases.

Trusting you will greatly oblige me by kindly inserting the above lines and facts in your much esteemed journal.

I have the honor to be,

Sir,

Your most obedient servant,

UMRITO LALL DEB, L.M.S.,

CALCUTTA
October, 1905

Retired Assistant Surgeon of the
Hindmah General Hospital

POTT'S FRACTURE

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—We hear of Pott's fracture being of common occurrence, but within the last few years I have had two cases: three of simple oblique fracture at lower end of fibula all on left side, and two of rupture of leg on left side also caused in a peculiar manner—two cases of fracture, one lady and gentleman, while playing tennis on a pukka cemented court wearing rubber soled shoes running up quickly to meet the ball suddenly stopped, stooping down and seizing the leg of the third gentleman while running forward to catch a ball at cricket hit above was similarly stopped and assumed the same position all described the immediate sensation as if struck by a bullet. The treatment was rest, a plaster of Paris splint for a fortnight and a rubber bandage after lameness lasted for another fortnight. There is no doubt a certain degree of danger exists in wearing rubber soled shoes on a pukka court in so far as the friction induces a sticky condition and grip and as the momentum of running forward must be considerable, a foot held fast just then has to cause something to yield the cricket case being on grass was probably stopped by the foot entering a depression or cup through cattle grazing around, the rupture cases were at tennis also but on a grass court and possibly the stoppage of momentum was not sufficient to bring the body to a complete halt. The same sensation was experienced at the time. These cases were more painful and lasting than the fracture ones, all were heavy weights, the men from 14st. 7lbs up wards and the lady 12st. 4lbs.

Yours, &c.

A MCCABE DALLAS,

D.M. & CH., L.M., L.R.C.P.I.

October, 1905

A CASE OF TRAUMATIC TETANUS CURED BY ANTI-TETANIC SERUM INJECTION

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR.—Kali Chhnan 35, Hindu male was brought into the R. J. Hospital on the 20th April 1905. The right arm just above

the bend of the elbow was caught into a local oil mill and lacerated extensively, but the brachial artery was saved.

The condition of the patient was good and the arm was dressed antiseptically and put up in splint.

The wound remained healthy and the patient continued to progress well till the 3rd May 1905, when he developed symptoms of tetanus. He complained of pain and stiffness in the muscles of the neck and could not open his mouth well. The usual bromide and chloral mixture was ordered.

4th May 1905—Could not sleep well 10 C C. anti tetani serum injected.

5th May 1905—A dose of calomel was given to open the bowels and the serum injection was repeated.

6th May 1905—Slept little. Muscles in the neck still stiff but could open his mouth better.

7th May 1905—Felt better, slept well. The pain and stiffness continued.

8th May 1905—Wound newly healed up. Could open his mouth and took his meals well. Another injection repeated as the stiffness continued.

9th May 1905—Slept well and pain and stiffness much less. He continued to progress well till the 16th when he again complained of a little pain and stiffness in the neck and lower jaw. Another injection of 10 C C. of anti tetani serum given.

17th May 1905—Pain and stiffness gone. Could open his mouth well.

He was then put on a tonic mixture which completed the recovery. He was discharged cured on 21st May 1905.

K P LAHIRI,

Assistant Surgeon

RAJ HOSPITAL, DERMHANA

WOUND OF ABDOMEN WITH PROLAPSE OF INTESTINE

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—A cultivator, at 50, was brought to me at the Bhiwandi Dispensary in the Thana District, at about 9 o'clock one night in April of last year. He was said to have been goaded by a buffalo about three hours previously. I found him lying on a *chairpoy* in great pain. He had an enormous prolapse of gut (small), full five feet, through an incised wound on the left side of the abdomen. It was covered with a number of most filthy cloths and the intestine and mesentery were found to be ingrained with a quantity of sand and other particles of dirt. The wound was about 2½ inches long and situated obliquely a little above the level of the umbilicus. I cannot give the exact situation as I have not the notes by me. There was a rent in the mesentery but the gut itself was intact. Except for the pain, the patient's general condition was good. He had evidently been taking liquor not long before as he smelt strongly of it. On enquiry it was elicited that he was habitually intemperate. The treatment adopted was to carefully clean the prolapsed part with warm perchloride lotion 1 in 5000, the embedded particles being picked off from one portion after another, the whole prolapse meanwhile being kept covered with towels soaked out of the warm lotion. The rent in the mesentery was not stitched as the patient did not look like standing much further handling and took chloroform badly. The bowel was returned as quickly as possible and the wound in the abdomen sewn up. The peritoneum was sutured separately and the muscles also, but no very careful attempt was made to secure close apposition of the latter owing to the need for hurry. A drain of strands of catgut was inserted. The whole proceeding lasted about 1½ hours, the longest time being spent in adding the parts of the gut.

There was, strange to say, not a bad symptom in the after course. There was copious evacuation (spontaneous) by the bowel the same night and the next morning the temperature was normal, no distension, sickness or pain.

The recovery was uninterrupted, the temperature never rising above 100.5. The dressings were not changed till after a week. After a fortnight the superficial sutures were removed. Silk had been used all through. No food was given for two days and solids not allowed till the tenth day.

I lost sight of the case after discharge but learn that a small ventral hernia has developed at the site of the injury.

The interest of the case lies in the difficulties in the way of securing perfect asepsis and the want of skilled assistance, in an out of the way dispensary and recovery following notwithstanding, showing that with care one need never despair even under adverse circumstances.

Yours, &c,

P A CORDEIRO

OPIUM POISONING IN A CHILD

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—Allarakhi, a Mahomedan female child, aged four months, was brought to Laheria Serai Hospital on the 1st August 1905, with the following history—The mother of the child, a day labourer, used to go to her work every morning

giving the child a little opium to put her to sleep for a longer period than usual. On the morning of the 1st August 1905, the child was given an overdose. When the mother came back from her work at about noon she found the child still sleeping fast which was not usually the case. She tried to awaken the child, but her efforts were to no purpose. She got frightened at this and called her friends and relatives to see the child. As the child could not be roused from slumber by anybody opium poisoning was suspected, and the child was brought to hospital. During admission in hospital the child was in profound sleep. Pupils very much contracted. Pulse and respiration were not bad. Attempts were immediately made to make the child vomit by giving emetics. But as free vomiting could not be induced then, stomach was washed several times, at first with tepid water, and then with weak solution of Potash Permanganate by means of a rubber catheter and brass syringe. Stomach was washed till the Permanganate of Potash solution came out unchanged in colour. Lastly some infusion of tea was pumped into the stomach. Though the child's condition improved considerably after washing the stomach, sleepiness did not pass off altogether for some eight hours more. All this time the child had to be kept awake by ringing a bell near its ear. The child was discharged cured next day.

Yours, &c,

JOGENDRA NATH BOSU,

Assistant Surgeon, Laheria Serai (Dumhanga)

AN ACCIDENTAL CASE OF POISONING BY STRYCHNINE RECOVERY

To the Editor of "THE INDIAN MEDICAL GAZETTE"

SIR,—One of my Hospital Assistants one day felt a bit feverish and to relieve himself he went into the dispensary to take a dose of Antifebrine. It was about 9 P.M. just before going to bed. Either on account of bad light or want of sufficient attention he unfortunately got hold of the wrong bottle and took about 5 grains of Strychnine thinking that it was Antifebrine. He swallowed the dose in hurry with the help of water and did not notice the bitter taste then, but immediately after he felt the bitterness left in the mouth and within five minutes began to feel as if he was choked and twitching and cramps set in. He at once suspected that he had poisoned himself. I happened to be at the place on inspection duty. He sent a word to me and in the meantime drank lot of water with plenty of common salt in it. He thus had vomited once or twice before I came. On my arrival I found him in tetanic spasms and in a very painful condition. His look was bluish, eyes prominent, pupils dilated, and pulse rapid and feeble. Beyond severe spasms there was no opisthotonos, risus sardonicus, or lock jaw. The subordinate was absolutely conscious and this added more to his suffering as he was all along talking of his death which appeared imminent. Stomach tube being out of the question I at once started with chloroform whiffs which seemed to give immediate relief to the spasms. I also got a mixture of potash bromide, chloral hydrate, and tincture hyoscyami made in full doses and gave the first two doses within half an hour. By 10 P.M. I noticed that the spasms were not so acute and the interval between them was a bit prolonged. This gave me hope and I repeated a dose after half an hour and the fourth after 12 midnight by which time the spasms had disappeared and the patient was fairly well and inclined to have a sleep. Next day the patient was thankful for his recovery but his whole body went on aching, and for three or four days he was not able to walk about. He also told me that for a day or so he had noises in the ear and any loud talking or walking used to give him sudden jerks. For nearly a week glare of the sun also used to hurt his eyes.

Remarks—Medicinal dose of the alkaloid is from $\frac{1}{10}$ to $\frac{1}{2}$ of a grain, and Taylor estimates the fatal dose for an adult half to two grains. In this case the lethal dose was therefore pretty heavy and yet recovery has taken place. This in my opinion is principally due to immediate steps which the Hospital Assistant had taken. Except salt and water nothing was at hand and thus the Hospital Assistant freely made use of and thus saved his life.

Yours, &c,

K PRASAD, M.B.

SHW EBO

MAJOR, I.M.S.,

Civil Surgeon

Service Notes

We reprint the following memorandum for which we are indebted to the Secretary to the Director General, I.M.S., as several correspondents have asked us questions about certain points.

As to the question of the date from which "service for pension" commences it will be seen from the memorandum of existing regulations that officers who recently have or will from this year enter the service, that a Lieutenant's commission dates from the day on which his course of instruction commences (para 6) and (para 30) "from date of first commission and includes all leave taken under paras 25 to 31. The point then remains is the period of "two months" referred to in para 3 of memorandum (and which is the leave usually given and taken between leaving the Army Medical School and starting for India), counted as authorised leave. We understand that this is so and that at present a Lieutenant who joins the Army Medical College, say, on 1st October, spends, say four months there, and starts for India two months later, say on 31st March will, at the end of September, have one year's service for pension to his credit. This is entirely as it should be, but unfortunately this does not apply to officers who entered the service previous to the issue of the present improved rules for example men who entered the service in the eighties can count the four months at Netley as service towards pension but they lose the two months or more which elapsed between their leaving Netley and their arrival in India, and the plight of those officers who entered the service after the 30th June 1890 (up till issue of recent improved rules) is still worse, for they do not count their four months at Netley but apparently do count the period of leave before embarkation (see note to para 1473 quoted below).

Therefore their method of counting the time for pension is still governed by para 1473, I A R Vol I part I, page 381, which in our copy dated 1st December 1898 (which, however, may not have the latest corrections) runs as follows—

"1473 The period passed by a medical officer at the Army Medical School in England reckons as service towards full pay pension. Service in India counts from date of first arrival.

Note—Officers entering the Indian Medical Service after 30th June 1890, will reckon service for pension continuously from the date of passing out of the medical school at Netley, the time being spent there being no longer allowed to count as service for pension.

We have, therefore, the anomaly in the same service of officers counting their service for pension in three different ways, namely,—

(1) Those who count the time at Netley, but not the leave between leaving Netley and their arrival in India.

(2) Those who do not count their time at Netley, but count from day of leaving it.

(3) Those who (as in recent years and under present regulations) count their service for pension from the date of their commission, that is, from the day of joining the Army Medical School or College.

It would be a gracious act and one much appreciated by the service if service for pension for all officers now in it were to date from date of first commission. It would remove a great anomaly and would not cost much.

Another point referred to by one correspondent may be briefly answered. The eight months' leave granted to Administrative Medical officers is gazetted under Art. 724, A R I Vol I part I (page 181) but an A M O may also take such privilege leave as may be due to him, if taken separately but if privilege leave is combined with other leave, the total period of combined leave must not exceed eight months e.g. an A M O may take three months' privilege leave, if due to him in, say, November, December and January and afterwards take his eight months' leave according to Art 724, A R I Vol I, part I.

It is to be regretted that the memorandum which we quote below does not make it quite clear that the rules therein do not apply equally, some apply to all others only to men who entered recently. It would be well to republish them showing clearly which rules do not apply to senior members of the service. As the extra pensions (I A R Vol I, part I Art 1475) are not to be given to officers appointed to the service after the examination in August 1889 this is probably the reason why no mention of them is made in the document quoted below. Art 1475 reads as follows—

"Four extra pensions of £100 per annum each are allowed to the senior officers of the Indian Medical Service, in the proportion of two for the Bengal and one each for the Madras and Bombay services as compensation for the withdrawal of the rank and privileges of a Colonel formerly conferred on officers of that service holding the appointments of Sanitary Commissioners.

"These extra pensions will be offered yearly in rotation to Surgeon Generals, Colonels, and to all Lieutenant Colonels, specially selected for increased pay, but under no circumstances will the extra pension be given to a Surgeon General or Colonel until he has completed three years' actual service in the grade, excluding all leave except privilege leave and

then only, when from failing health, or other unforeseen causes, he may be unable to complete his full term of service.

Should the full number of pensions not be accepted in any one official year, the balance will lapse, and will not be offered during the following year.

As said above this Article only applies to I M S officers who entered the service before August 1889.

We do not know of any order doing away with the "good service pensions" given as "rewards for distinguished or meritorious service" (I A R, Vol I, part I, Art 1491). There are fifty of these of £100 each (or Rs 1,000 if drawn in India), and are distributed among officers of the Indian Army and Indian Medical Service. They are usually given to officers on the effective list, and are given up by Colonels, I M S or Surgeon Generals when they get their *extra* pensions of £250 or £350 per annum. Formerly, they were continued after retirement but are not so given to officers who entered the Indian Army or I M S after July 1st 1881, so that these pensions practically only last for the last few years of service.

MEMORANDUM REGARDING THE POSITION OF OFFICERS APPOINTED TO HIS MAJESTY'S INDIAN MEDICAL SERVICE

India Office, May 1905

1 This memorandum is based on the regulations in force at the present time. They are subject to any alterations that may be determined on.

PASSAGE TO INDIA

2 Officers on appointment are, when possible, provided with passage to India by troop transport, when such accommodation is not available, passage at the public expense is provided by private steamer, or a passage allowance granted, if preferred.

3 Any officer who may neglect or refuse to proceed to India if ordered to do so within two months from the date of terminating his course of instruction, or within 14 days of the termination of his hospital appointment if the Secretary of State for India has permitted him to hold one will be considered as having forfeited his commission unless special circumstances shall, in the opinion of the Secretary of State in Council, justify a departure from this regulation.

PAY PREVIOUS TO ARRIVAL IN INDIA

4 The rate of pay drawn by Lieutenants of the Indian Medical Service previous to arrival in India is 14s a day, but a Lieutenant (1) who has been permitted by the Secretary of State to hold a hospital appointment will receive no pay while holding it, (2) who is detained by illness in this country will be paid at the rate of 250s a year from the date on which he would otherwise have embarked until the date of embarkation, and at the rate of 14s a day during the voyage to India. (For rates subsequent to their landing in India, see paras 16, 17, and 18).

Pay at the above rate is issued in this country up to the date of embarkation, and an advance of two months' pay at the same rate is also made prior to embarkation, which is adjusted in India in accordance with the rate laid down in para 16.

GRADES AND PRECEDENCE

5 The grades of officers in the Indian Medical Service are six in number, viz—

- 1 Surgeon General (ranking as Major General*)
- 2 Colonel
- 3 Lieutenant Colonel
- 4 Major
- 5 Captain
- 6 Lieutenant

PROMOTION

6 A Lieutenant's Commission dates from the day on which his course of instruction commences.

7 A Lieutenant may be promoted to Captain on completion of three years' full pay service from date of first Commission but after completing 18 months' service and before promotion to the rank of Captain, he will be required to pass an examination in military law and military medical organisation, the result of which may affect his promotion.

8 A Captain is promoted to Major on completion of 12 years' full pay service, but this promotion is accelerated by six months in the case of officers who fulfil certain specified conditions.

9 A Major is promoted to Lieutenant Colonel on completion of 5 years' full pay service in the rank of Major.

* The Director General, Indian Medical Service will rank either as Major General or Lieutenant General as may be decided in each case by the Secretary of State for India in Council.

† See, however, para 42.

‡ See, however, para 40.

* Para 1, No 1017 Military Dept. Statute 23rd October 1903 shows that only officers admitted to the service on and after 1st September 1902 will count for promotion and also pension from date of Commission—Ed. I M G

* Leave to I M S officers in permanent Civil employ is governed by rules and rates laid down in the Civil Service Regulations —
Ed. I M G

34 Service for pension reckons from date of first commission, and includes all leave taken under the rules quoted in paras. 25 to 31 (See also para 42)

35 A Surgeon General, after three years' active employment in that appointment, is entitled to retire upon a pension of £450 per annum, in addition to that to which he may be entitled under the above scale

36 A Colonel is entitled, after three years' active employment in that appointment, to retire upon a pension of £125 per annum, in addition to the pension to which he may be entitled under the above scale, and after five years of such employment on an additional pension of £250 in all

37 In each of the above cases stated in paras. 35 and 36, eight months' absence on leave is allowed to count towards actual service in those grades (See para 40)

38 A Surgeon General or Colonel who has completed his term of service and has reverted to British pay may reside in Europe at the same time qualifying for higher pension

39 With a view to maintain the efficiency of the service all officers of the rank of Lieutenant Colonel and Major are placed on the retired list when they have attained the age of 55 years, the Director General, Indian Medical Service, when he has attained the age of 62 years, and all other Surgeon Generals and Colonels when they have attained the age of 60 years. But a Lieutenant Colonel, who has been specially selected for increased pay, if he attains the age of 55 years before he becomes entitled to the pension for 30 years' service, may be retained until completion of such service, and in any special case, where it would appear to be for the good of the service that an officer should continue in employment, he may be so continued subject in each case to the sanction of the Secretary of State for India in Council

40 Officers placed on temporary or permanent half pay under para 27 are granted half pay at the following rates —

	Rates of Half Pay	
	Per diem	Per annum
Under 5 years' service	6 0	109 10 0
After 5 " "	8 0	146 0 0
" 10 " "	10 0	182 10 0
" 15 " "	13 6	245 7 6

Officers cannot retire in India on half pay (No 45, 28th February 1867)

An officer of less than three years' service although he may be transferred to the half pay list under the general conditions of transfer, will not be granted any half pay, unless his unfitness has been caused by service

INVALID PENSION

41 An officer who has become incapacitated for further service in India on account of unfitness caused by duty may, after he has been two years on temporary half pay, be granted an Invalid Pension on the following scale —

	Per annum
After 16 years' pension service	272
" 15 " " "	252
" 14 " " "	232
" 13 " " "	212
" 12 " " "	192

42 Time (not exceeding one year) passed on temporary half pay reckons as service for promotion and pension, in the case of an officer placed on half pay on account of ill health contracted in the performance of military duty

43 Officers of the Indian Medical Service are liable, after retirement on pension before completing 30 years' service, to recall to military duty in case of any great emergency arising, up to 55 years of age

WOUND PENSIONS

44 Officers are entitled to the same allowances on account of wounds received in action and injuries sustained through the performance of military duty otherwise than in action, as are granted to combatant officers of His Majesty's Indian Military Forces holding the corresponding military rank

FAMILY PENSIONS

45 The claims to pension of widows and families of officers are treated under the provisions of such Royal Warrant regulating the grant of pensions to the widows and families of British Officers as may be in force at the time being

46 The widows and families of officers are also entitled to pensions under the Indian Service Family Pension Regulations, for the benefits of which all officers must as a condition of their appointment, subscribe from the date of their arrival in India

The following regulations for the grant of study leave to officers of the Indian Medical Service are published for information —

1 Extra furlough for the purpose of study may be granted to officers of the Indian Medical Service on the recommendation of the Director General, Indian Medical Service

2 The period of such study leave will be calculated at the rate of one month for each year of service, up to a total of twelve months in all during an officer's service

3 Study leave may be taken at any time but will not be granted more than twice in the course of an officer's service

4 The minimum period of study which will render an officer eligible for study leave shall be two months

5 The minimum period of leave granted solely as study leave shall be six months. Time spent on the journey to and from India by an officer whose study leave is not combined with any other kind of leave, will not count as study leave but the allowance specified in rule 9 will be granted during the period of study only

6 Study leave can be combined with any other kind of leave provided the period occupied in study is not less than two months and in the case of leave on medical certificate, provided that the Medical Board at the India Office certifies that the officer is fit for study. In the case, however, of officers in military employment study leave cannot be taken in continuation of the combined privilege leave and furlough admissible under the terms of India Army Order No. 64 of 1904, if the total period would thereby exceed eight months, but study leave may be so taken provided such leave is for not less than two months and the total period of combined privilege leave, furlough and study leave does not exceed eight months, this limitation to eight months does not however apply in the case of study leave combined with privilege leave alone. The total period of absence from India will be strictly limited to two years

7 Except as provided for in rule 8 all applications for study leave shall be submitted with the unit officer's certificate, to the Director General, Indian Medical Service, through the prescribed channel, and the course or courses of study contemplated and any examination the candidate proposes to undergo shall be clearly specified therein

8 Officers on furlough who wish to have part of their furlough converted into study leave should address the Under Secretary of State, India Office and should furnish a statement showing how it is proposed to spend the study leave

9 During the course of study lodging allowance at the rate of 8s a day for a field officer, 6s for a Captain, and 4s for a Lieutenant will be granted. It is to be understood that in order to qualify for the grant of study leave or for the receipt of lodging allowance a definite course of study at a recognised institution, which will occupy the time of the officer for five or six days a week must be pursued

10 On completion of study the certificates of examinations passed, or the certificates of special study which must show the dates of commencement and termination of the course, with any remarks by the instructor shall be forwarded to the Under Secretary of State, India Office, who will arrange for the transmission of the documents to the Director General, Indian Medical Service. Officers may also be called upon to report themselves in person to the President of the Medical Board, India Office, on the conclusion of their course of study

11 Study leave will count as service for promotion and pension but not for furlough or any other leave. It will not affect any leave which may already be due to an officer

The following is republished from Northern Command orders —

"644 Furlough and Leave — Many instances have occurred of the instructions in paragraph 236, Army Regulations, India, Volume II with regard to officers providing themselves with copies of the order granting them leave not having been observed. All officers (commissioned, honorary commissioned, and warrant) proceeding out of India on leave, or under other circumstances must be careful to invariably obtain in triplicate a copy of the order (India Army Form Z 2053) granting them leave and produce it when they call at the Presidency Pay Office, Bombay, for the final settlement of their pay. If this is not done much inconvenience is caused and delay results in granting them their last pay certificates

The following order is published —

"579 Medical Department—Establishments—Army—Hospital Corps — The Government of India have sanctioned the reorganisation of the Army Hospital Corps on a divisional (or independent brigade) basis as shown in the annexed statement, and the administrative measures detailed below, on the understanding that to prevent additional expenditure e.g., on passages extra local recruiting should be resorted to in special circumstances only, and not as a general rule —

(1) Each company will be administered by the Principal Medical Officer of the division (or independent

concerned who will also carry out all the active duties in connection with the corps performed by Command Principal Medical

when not able to obtain locally all the require, will be allowed to recruit in any area, irrespective of whether it is in the human or not, from one company to another will be an divisional (or independent brigade) command in communication with each other

AS THE FUTURE DISTRIBUTION OF COM ARMY HOSPITAL CORPS, EACH COMPANY DIVIDED INTO AS MANY DETACHMENTS AS RATE MEDICAL CHARGES

Northern Command

- 1st (Peshawar) Division
- 2nd (Rawal Pindi) Division
- 3rd (Lahore) Division

Western Command

- 4th (Quetta) Division
- 5th (Mhow)
- 6th (Poona)
- Adon Brigade

Eastern Command

- 7th (Meerut) Division
- 8th (Lucknow)

Secunderabad Division

- 9th (Secunderabad) Division

Burma Division

- Burma Division
- the present Nos 3 and 4 Companies
- " " 25 and 27
- " " 8, 23, 24 and 26 Companies
- " " 10, 20 and 22
- company
- the present Nos 5, 6 and 10 Companies
- " " 7, 9 and 11
- " " 12, 13, 14 and 15
- " " 17 and 18

for will be hailed with relief by all con

Telegraphic address—With reference to India 42 of 1905, it is notified that it has been the present system of telegraphic code revert to the old method of abbreviated set from the 1st October. A general list appear in Section XI, A and B, of the Guide to be published on the 1st October

appreciative account of the work done by taken from the official report on the earthquake on 4th April 1904 (*Punjab* 1904)

arrangements were excellent and covered all the area. Major Lane had the heavy work of distribution of medical stores and equipment to be congratulated on the success to prevent the occurrence of epidemic during the summer. Of the other employed in the district the work done by Mr. I. M. S., at Kangra may be specially noted. He was in medical charge of Kangra and where casualties were most abundant, he managed the supply and feeding of the wounded. Major Browning Smith, I. M. S., was the scene of the disaster at Dharmasala, where he received the benefit of his professional knowledge. At the same time he was able to help in the organization of food supplies for Palampur and Jhelum. Mr. I. M. S., had the heaviest possible burden of the numbers of wounded in the Cantonment night and day in a manner that deserves commendation.

Other European Medical Officers who were at Kangra Proper—Captain Surgeon L. J. M. Deas, I. M. S., and Surgeon G. E. Shrew, for Kulu—Major Surgeon W. G. Collinson, I. M. S., and Military Surgeon Farmer. The acknowledgments of the Lieutenant-Governor have already been conveyed to Mr. W. O'Gorman, I. M. S., Medical Store for his promptitude in giving supplies. Mr. Clay, despite the loss of her husband, did in the care and nursing of the injured ladies, was also most devoted in her assistance. Assistant-Surgeon Owen, I. M. S., with injured persons in rendering medical assistance.

Veterinary Assistant Ganga Ram without any prompting did wonders in the way of rendering first aid to the injured.

Dr. Datta, Civil Surgeon of Hoshiarpur, together with five Hospital Assistants and Compounders, bringing equipment with them, marched up promptly from Hoshiarpur to the southern portion of the affected area and rendered valuable aid, both medical and moral. His familiarity with the people and his kindness of manner enabled him, while relieving distress and treating the wounded, to restore confidence and to encourage the people to set to work to repair the damages which had befallen them.

The Ludhiana Medical School very kindly sent Miss Ashby and a female Hospital Assistant and a Compounder, and the Arya Samaj gave all the assistance in their power.

Rai Bahadur Thakur Das, Assistant Surgeon, who was recalled from leave, gave Captain Deas, I. M. S., the greatest assistance in every way and worked hard and enthusiastically, as also did Hospital Assistant Ghidhral Lal (Nurpur), who was on duty in Kangra.

Other Native Medical Officers who did good work were Assistant Surgeons Jai Gopal Sethi, Mathura Das, Kishen Singh and Chandu Lal.

Assistant Surgeon Kidm Nath was present at Sultampur at the time of the earthquake and attended to a large number of injured people at and near Sultampur at once.

Hospital Assistant Narain Das and Hospital Assistant Sena Singh worked independently over most difficult country in Kulu and attended to many cases of injury.

Civil Hospital Assistant Amik Singh worked well under the direction of Lieutenant Collinson, I. M. S.

Hospital Storekeeper Parbat Singh was of great assistance in obtaining supplies for the Hospital establishment in Kulu.

The following Majors are promoted Lieutenant Colonels, I. M. S., from 1st October 1905—

- Henry Robert Woolbert, M. B., F. R. C. S.
- George Henry Baker, M. B.
- Joseph Rossmont Adie, M. B.
- Arthur Charles Yonnan, M. B.
- Alfred William Alecock, M. B., C. I. F., F. R. S.
- John Macfarlane Cadell, M. B.

The following Lieutenants are promoted Captains, I. M. S., from 1st September, 1905—

- John Hanna Murray, M. B.
- Florence Perceval Mackie, M. B., F. R. C. S.
- Arthur Trogelles Pridham, M. B.
- Frank Powell Connol, F. R. C. S.
- John O'Leary, M. B.
- Samuel Rickard Christophers, M. B.
- Harry Emelio Smith, M. B.
- Hugh Reginald Dutton
- Vincent Blumhardt Nesheld, F. R. C. S.
- Henry Martyn Brown, M. B.
- Arthur Frederick Pilkington
- Philip George Easton
- Wilfrid Wynne Joudwine
- Thomas Charles McCombie Young, M. B.
- George Adam Jolly, M. B.
- Henry Collington Brown, M. B.
- George Harold Lawson Whale, M. B.
- Abdurrahman Khan Laudde, M. B.
- Walter Julius Collinson, M. B.
- Osbert Lindsay Dunn
- Herbert Michael Henry Melhuish
- Horace Harold Kiddle
- Richard Francis Chetwynd Talbot, M. D., F. R. C. S. I.
- Raghuber Dayal Saigol
- Cecil Edward Bulteel
- John Lumsden Lunham, M. B.
- Frederick Colin Rogers
- Manning Baket, M. B.
- Clayton Alexander Francis Hingston

COLONEL M. D. MORIARTY, M. D., F. R. C. S. I., I. M. S., administrative medical officer, C. P., has been permitted to retire from the service from 25th October 1905. He entered the service in October 1872, and was for many years a well known and successful Civil Surgeon. He succeeded Surgeon General Scott Reid as A. M. O. in the Central Provinces. He only returned from leave last December.

He is succeeded in the Central Provinces by Colonel Pat A. Weir, I. M. S. Colonel Weir entered the service on 30th September 1875, and therefore gets his Colonel's rank in just 30 years' service and at the age of 54 years.

LIEUTENANT COLONEL D. G. CRAWFORD writes us as follows—

"In the October number of the *Gazette* when announcing that Major Leonard Rogers, of the Bengal Medical Service, has had conferred upon him the honour of the Fellowship of the Royal College of Physicians of London, the Editor enquires whether any other officer of the I. M. S., besides

Captain Rogers and Lieutenant Colonel Harris, holds this diploma. This Fellowship has not very often been bestowed upon officers of the I M S, and apparently no other officer now serving, except the two mentioned above holds it. A certain number of I M S men, however, have obtained this diploma from time to time. The following list, which is almost certainly incomplete, contains the names of twenty officers of the I M S who have held it. Only eight including Harris and Rogers, are now alive. Eight, besides these two, were made Fellows while still in the service, the rest after their retirement. Murchison and Playfair, as is well known, resigned their commissions a few years after they joined, and both were leading London physicians when they became Fellows of the College. Captain Rogers has got the fellowship at a much younger age and a much earlier period of his career than any of the other officers who have obtained it, excluding Murchison who had left the service. The case of Mr John Peet seems curious, for he had spent great part of his service in the Education Department, and though an officer of I M S could hardly be considered a practising medical man. A good many men have held the fellowship of the Edinburgh, Glasgow, and Dublin Colleges, especially the first named, which several men got at a much earlier date than the first of those who obtained the London Fellowship. The other three Colleges, however, were less chary of bestowing their highest diploma at least in the early days, than the London College."

Netley, the Indian Government pension, and therefore rightly claim their service in the Professoriate now, and the Indian Government new Royal Army Medical College mention. Two months have expired particulars connected with the general's appointment in India to Corps. Long previous to that cor between the Home and Indian argument of this matter. It will sea question still hangs fire, and that three vacancies in the administrative Army Medical Corps are still in state of affairs is scarcely creditable is a puzzle. The vacancies to retirements of Surgeon General B Hughes.

CAPTAIN W F HARVEY, M B, a Deputy Sanitary Commissioner and Director of the Pasteur Institute Anderson McKendrick, I M S, is

THE services of Assistant-Surgeon placed at the disposal of the British employ

I M S Officers holding F R C P, London

Name	Date of entry	Date of retirement
1 Bengal		
1 Jackson, John	22nd June 1830	R 31st December 1855
2 Goodeve, H H	16th April 1831	R 9th September 1853
3 Entwistle, W C B	11th June 1841	R. 24th April 1863
4 Fayrer, J	29th June 1850	R. 1st December 1873
5 Bertson, W B	30th June 1852	R. 20th December 1863
6 Murchison, C	4th April 1853	R. October 1855
7 Ewart, J	20th December 1853	R. 31st January 1879
8 Smith, D B	28th December 1855	R 1st March 1882
9 Charles, T E	22nd October 1856	R 12th September 1882
10 Playfair, W S	4th August 1857	R 20th October 1864
11 Harvey, R	1st April 1865	D 1st December 1901
12 Birch, E A	31st March 1866	R 4th October 1893
13 McConnell J F P	1st April 1870	D 24th August 1896
14 Harris, G F A	30th September 1878	
15 Rogers, L	20th July 1893	
2 Madras		
1 Forbes, J	24th August 1830	R 28th February 1863
2 Waring, E J	22nd June 1849	R. 1st September 1865
3 Bombay		
1 Morehead, C	26th April 1829	R 30th January 1862
2 Peet, J	2nd May 1842	R 14th January 1867
3 Cook, H	24th January 1855	R 21st November 1886

THE following "explanation" of the recent appointment to the R A M College by which the I M S has lost an appointment for a retired officer has appeared. "It has caused some concern to officers of the Indian Medical Service that one of their body Col K McLeod, M D who filled the appointment of Professor of Clinical and Military Medicine at the Royal Army Medical College, should have, on retirement, been succeeded, as was recently announced by an officer of the Royal Army Medical Corps (Lieut Col R J Simpson) in the professorship, which is thus lost forever to the Indian Medical Service. The *Army and Navy Gazette* offers the following explanation: "While the Army Medical School existed at the Royal Victoria Hospital,

ASSISTANT-SURGEON M J granted two months' leave from

CAPTAIN C A GOURLAY, M D Deputy Sanitary Commissioner,

LIEUTENANT COLONEL G J Colonel, dated 16th October, but will reckon from 1st October 1901

MILITARY ASSISTANT SURGEON has gone for employment under to Jask in the Persian Gulf, with

ASSISTANT SURGEON F W HOLMES, I M S, is appointed to the charge of the Mussouri Staff Dispensary

SURGEON GENERAL W L GUBBINS, C B, V I S, M V O, the P M O of Eastern Command, is granted leave for eight months

CAPTAIN H B STEFF, I M S, is posted to the officiating medical charge of 8th Rajputs

THE following appointments have been made in the new province of Eastern Bengal and Assam, viz, Colonel D Wilkie, I M S, remains in Assam, but as Inspector General of Civil Hospitals in the New Province, Lieutenant Colonel R R Woir, I M S, becomes Inspector General of Prisons, E B and A, and Major E C Hare, I M S, becomes Sanitary Commissioner

THE following I M S officers in Civil employ, Madras, were due back from leave on the dates mentioned —
Major Fearnside on 12th October
Major P C Gabbett, on 14th November 1905
Captain T H Fonlkes, on 3rd October 1905
Captain T E Watson, on 11th November 1905
Captain C G Webster on 22nd October 1905
Captain J W Cornwall, on 10th December 1905
Captain W G Richards, on 20th October 1905
Captain R Bryson, on 30th November 1905
Captain H Kirkpatrick, on 14th November 1905

THE leave of Captain A Miller, I M S, 18 months, will not expire till 10th December 1906

CAPTAIN T H SIMONS, I M S, is not due out from leave till 12th November 1906

CAPTAIN D C KEMP, I M S, whose privilege leave expired on 18th September, applied for an extension of leave

CAPTAIN W H TUCKER's leave will expire on 18th January 1906

CAPTAIN J P CAMERON, I M S, arrived for duty in the Civil Medical Department on 19th August 1905

WE are glad to see that Lieutenant-Colonel A M Davies, R A M C, has been appointed Professor of Hygiene at the R A M College, London

Colonel Davies as long as 17 years ago acted as Professor at Netley during the last illness of Professor De Ohaumont, and in the opinion of many he should have got this professorship many years ago

SURGEON LIEUTENANT COLONEL W R CROOKE-LAWLESS, of the Coldstream Guards, who has come out as Surgeon to His Excellency Lord Minto will be remembered by many in India. He served as Surgeon W R Crooke in the Punjab Command, and took the additional name Lawless on his marriage

THE Secretary of State for India has approved* of the proposal that field officers may be considered eligible for non entitled passages in homeward bound transports after passages have been provided for those enumerated in paragraph 43, Army Regulations, India, Volume X, under heading "1st Class"

Such passages are to be granted in order of juniority

MAJOR T W A FULLERTON, I M S, Civil Surgeon, U P, has gone on 15 months' combined leave

MAJOR W YOUNG, I M S, Civil Surgeon, Naini Tal, has gone on combined leave for two years

ON the departure of Captain E F Gordon Tucker, I M S, to civil employ, Bombay, Captain A J V Betts, I M S, is appointed to the officiating medical charge of 108th Infantry

LIEUTENANT COLONEL A. T BOWN I M S, was granted one month's extension of leave at home

CAPTAIN L HIRSCH, I M S, was granted two months' extension of leave at home

CAPTAIN A E J LISTER, I M S, was granted six months' extension of leave on medical certificate

MAJOR A W T BUIST, I M S, returned to Multan from leave on 28th September 1905, relieving Captain G C L Kernans, I M S, who was acting as Civil Surgeon as a collateral charge

* Quarter Master General in India's No 2970 A, dated 12th October 1905

MAJOR W H OGILVIE, I M S, assumed charge of the duties of Civil Surgeon Jholum, on 23rd September, relieving Lieutenant W W Jendwine, I M S

CAPTAIN C J ROBERTSON MILNE, I M S, Superintendent, Punjab Lunatic Asylum, Lahore, resumed charge of his duties on 1st October

CONSEQUENT on the restoration of a Civil Surgeoncy of 1st class, Lieutenant-Colonel H Hendley, M D, D P H, Civil Surgeon, is promoted to 1st class, with effect from 15th July 1905

MAJOR S H HENDERSON, I M S, Superintendent, Central Prison, Agra, has obtained one year's combined leave

MAJOR J S S LUMSDEN, I M S, on return from leave, is posted to Bahraich, U P

ON return from leave Captain W Selby, I M S, is posted to Sitapur

MAJOR J GARVIE, I M S, is appointed Civil Surgeon of Naini Tal

ASSISTANT SURGEON M J MISTRI has been appointed to act as Civil Surgeon of Bioach

MAJOR S E PRALL, I M S, took over charge of the Aden Special Prison on 25th September

LIEUTENANT COLONEL O L SWAINE, I M S, Civil Surgeon of Nagpur, C P, was granted combined leave, with effect from 17th October, for 18 months and 6 days

CAPTAINS T STODART and B Nauth of the batch of 29th July 1893 are promoted Majors, I M S, from 29th July 1905

CAPTAIN A E BERRY M R, I M S, who is at the head of the Madras batch of 29th January 1894, is also promoted Major from 20th July 1905. This is giving him six months' promotion, in accordance with the new regulations

CAPTAINS E H SHARMAN I M S, and T H Fonlkes F R C S, I M S, the first and the fourth man in the Madras batch of 29th July 1893, are promoted Majors from 30th January 1905, i.e., they receive six months' accelerated promotion

CAPTAIN E BISSET, I M S, is appointed to the medical charge of the 56th Infantry (F F). He entered the service on 29th January 1902

CAPTAIN G KING, I M S, on return from leave, is again placed on plague duty in Bihar. Last year by his work in Saran District Captain King won golden opinions from the Municipalities and District Boards for his tact and management

LIEUTENANT W TARR, I M S, assumed charge of the Civil Medical duties of the Sheikh Budin Sanatorium on the forenoon of the 28th of August 1905, relieving Lieutenant H Watts, I M S

LIEUTENANT HUGH WATTS, I M S, assumed charge of the Civil Medical duties of the Sheikh Budin Sanatorium on the afternoon of the 11th of August 1905, relieving Lieutenant C A Gills, I M S

CAPTAIN L P STEPHEN, I M S, 110th Mahatta Light Infantry, has been granted 17 months' leave out of India, including 5 months study leave. Pension service sixth year commenced 29th January 1905

WE regret to learn that Major W C Vickers, I M S, who went on medical leave a short time ago, died in England on 18th August 1905

THE leave of Major R Robertson I M S, Professor of Medicine, Madras Medical College, expired on 7th November 1905

MAJOR W S P RICKETTS, M B, I M S, obtained 33 days' privilege leave from 2nd October 1905

LIEUTENANT J L LUNHAM I M S, was appointed Civil Surgeon of Jacobabad in addition to his military duties from 1st September 1905

MR D P SETHNA, L M & S, is appointed an Honorary Assistant Physician, J J Hospital, Bombay, for one year, vice Mr S A Banker, L M & S, vacated

ON return from leave Military Assistant Surgeon M Courtney, I S M D again was appointed to Hissar as Civil Surgeon

MAJOR W RONALDSON CLARKE, I M S, Civil Surgeon of Umballa, obtained 28 days' privilege leave from 18th September 1905

CAPTAIN C W F MELVILLE, I M S is appointed to the medical charge 9th Hodson's Horse Captain Melville gets his regiments at 4 years and 9 months service

CAPTAIN G C L KEHNANS, I M S, is appointed to the medical charge of 12th Cavalry Captain Kechnans' first commission is dated 27th June 1901

CAPTAIN S H LEE ABBOTT, I M S, obtains medical charge of 21st Punjab His first commission is only dated 29th January 1902

MAJOR W E A ARMSTRONG, I M S, has been placed on temporary half pay from 12th March 1905 He entered the Madras Medical Service as Surgeon Lieutenant on 30th January 1892

CAPTAIN N S WELLS, I M S, is appointed Civil Surgeon Lushai Hills, at Aijal

CAPTAIN A LEVENTON, I M S is appointed Civil Surgeon of Cachar at Silchar

MR F G HURST is appointed to the medical charge of Lungleh Subdivision, Lushai Hills

LIEUTENANT COLONEL J ANDERSON I M S, has returned from leave

MR S A POWELL, M B, M Ch was granted three months' privilege leave from 7th October, and Major B B Grayfoot, I M S, acted as Police Surgeon, Bombay, and Professor of Botany, in addition to his other duties, for Mr Powell

PRIVILEGE leave for one month and seven days in combination with furlough for seven months and twenty three days, under Articles 233 (i), 260 and 311 of the Civil Service Regulations, is granted to Captain N R J Raimor, I M S, Civil Surgeon, Chindwara with effect from the 11th instant or the subsequent date on which he is permitted to avail himself of it

CAPTAIN J C S OXLEY, I M S, Civil Surgeon, Seoni, is placed in visiting medical charge of the Chindwara District during the absence on leave of Captain Raimor, I M S, or until further orders

MAJOR A J MACNAB, F R C S, I M S, Surgeon to H E Lord Curzon will take short leave home previous to returning to Simla as Civil Surgeon *vice* Major C M Green, F R C S, I M S, whose term as Civil Surgeon will soon expire

WITH effect from 15th October the services of Lieutenant-Colonel R Havelock Charles, F R C S I, M D, Professor of Surgery, Calcutta, are placed at the disposal of the Foreign Department, for service on the staff of H R H the Prince of Wales during his tour in India

THE services of Captain W C H Forester, M B, I M S, are placed temporarily at the disposal of the Punjab Government

THE services of Captain D N Anderson, M B, I M S, are placed temporarily at the disposal of the Chief Commissioner, C P for employment in the Jail Department

ASSISTANT-SURGEON A ALLISON, I S M D, has been transferred to the new Province from Bengal and is posted as Civil Surgeon of Noakhali

CAPTAIN G T BIRDWOOD, I M S, Civil Surgeon, Agra, obtained privilege leave for 15 days from 4th October 1905

CAPTAIN E J MORGAN I M S, Civil Surgeon, Muttra, obtained one month's sick leave from 29th August 1905

CAPTAIN A W R COCHRAN I M S, Superintendent, Central Asylum Agra, acted as Civil Surgeon of Agra during the absence of Captain Birdwood, I M S

THE services of Captain G McPherson, M B I M S, are placed at the disposal of the Surgeon General, Bombay, for plague duty

LIEUTENANT A C INGRAM, I M S, acted in addition to his other duties as Civil Surgeon of Aden from 4th September

CAPTAIN R P WILSON, I M S, now officiating as First Surgeon, Presidency General Hospital, Calcutta, is confirmed in Civil employ in Bengal

THE services of Captain M Dick, I M S, are placed permanently at the disposal of the Government of Burma

CAPTAIN J W LITTLE, I M S, an officiating Agency Surgeon of the 2nd class and Agency Surgeon in Kotah and Jhalawar, held charge of the current duties of the office of Political Agent in Kotah and Jhalawar, in addition to his own duties, from the 1st to the 23rd August 1905, both days inclusive

THE date of the appointment of Colonel W G King, O I I, I M S, as Colonel and as Inspector General of Civil Hospitals Burma, is dated 12th September 1905

THERAPEUTIC NOTES AND PREPARATIONS

DR. H A D JOWETT, who for nearly ten years has filled the position of Senior Research Chemist on the staff of Dr F B Power, Director of the Wellcome Chemical Research Laboratories, is about to leave that position in consequence of his appointment as Chief of the Experimental Department at the works of Messrs Burroughs, Wellcome & Co., Dartford, Kent

THE well known London firm, C J Hewlett and Son, send us specimens of three valuable new preparations, one LIN BETULÆ CO, or oil of sweet birch, which contains methyl salicylate The preparation is made up with Menthol and Camphor and should be most useful in Rheumatism, Lumbago, &c The same firm have brought out *Somnigen*, an improved form of tincture of opium, it is clear and sherry coloured and consists of hydrobromates of opium dissolved in good sherry It has the advantage of not being followed by nausea and headache and other drawbacks of laudanum This firm's Mist. Hepatic Cone is a well-known preparation, useful in all forms of so called "biliousness" in gastric catarrh, flatulency, &c

Notice

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited Contributors of Original Articles will receive 25 Reprints gratis if requested

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs Thacker, Spink & Co., Calcutta

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs Thacker, Spink & Co., Calcutta.

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BOOKS, REPORTS, &c, RECEIVED

Military Hygiene Major Caldwell, R A M C Baillière, Tindall & Cox
Health Resorts of Europe Linn
Scientific Memoirs, No 10 Captain James,
Report of Vaccination in Madras
Mosquitoes in Brazil
Nothnagel's Cyclopaedia, Malaria and Influenza Saunders & Co
Diseases of Blood Saunders & Co
Raymond's Physiology Saunders & Co
Kelly's Vermiform Appendix Saunders & Co
Scudder on Fractures Saunders & Co
Dietetics for Nurses Saunders & Co
Operative Ophthalmology Atlas Saunders & Co
Handbook for Nurses Beck Saunders & Co
Atlas of Anatomy Shulz and Stewart Saunders & Co
Ashton's Gynaecology Saunders & Co
Chemistry and Toxicology Holland Saunders & Co
Massage Saunders & Co
Prevention of Senility Crichton Browne
Food and Disease F Hare Longmans & Co
Roberts Medicine New Edition
Keen's Lectures and Addresses Saunders & Co

LETTERS COMMUNICATIONS, &c RECEIVED FROM —

Major H Smith, Jullundur Capt McLav, I M S Calcutta, Major Chaytor White Lucknow, Capt S P James Simla, Major Marks, I M S, Lieut Nesfield, I M S Capt. Waters I M S, Puri, Major Calvert, I M S, London, Major Duer, I M S, Canada Major K Prasad Shwabo, I M S, Bangalore, Capt Oxley, I M S Seoni, Major Sutherland, Akola, Capt. I. McCarrison, Gilgit

